



## Social Housing and Spatial Justice

A GIS based social area analysis of multi-level social housing and small scale communities in Guangzhou

Ruixia Chao



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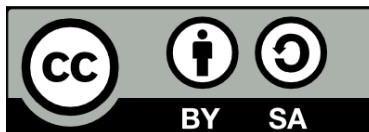
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## **Abstract:**

Guangzhou is undergoing a rapid social development and a major spatial transformation. During this process, social housing policy gradually becomes one of the main drivers for spatial resource distribution and population flows across the city area. As a pilot city, Guangzhou's intensive construction of social housing blocks was designed to address the living conditions of substantial numbers of local families in urban areas. The development of social housing can be traced back to 1994, have experienced three waves of constructions. Despite the substantial benefits, there also appear to be certain unintended consequences which may affect living conditions and may imply a further lack of sociospatial resources. As such, the investigation of social housing may be indicative of the status of urban poverty. Earlier studies of urban poverty have focused separately on community development, political implications and geographical connections and lacked a systematic conceptual and theoretical framework integrating all three of these issues. Conceptually, this study aims to examine whether residents of social housing communities have experienced any injustices regarding the obtaining of physical resources within the city, or any unjust psychological perceptions. Guided by the "spatial justice theory", this analysis empirically surveyed 660 residents of 13 social housing communities in Guangzhou in greater detail. Based on three major criteria extracted from the theory: territorial distributive justice, economic inequality and locational discrimination, this research has examined correspondingly three major issues of accessibility of facilities, job-housing relationship and neighbourhood integration. The major questions are: 1) can residents in social housing easily access public facilities? 2) Do they experience difficulties in job-housing connection after resettlement? 3) Do they experience social exclusion or marginalization? Data relating to the ease of accessing public facilities, the commuting time to work and the degree of social integration were collected by questionnaires, while the physical locations of social housing buildings and communities were obtained from map databases. These data are processed with the spatial analysis in ArcGIS and statistical tests in SPSS, and each of the three justice degrees of the social housing target groups is estimated.

The results reveal that residents' assessments of services provided by facilities depends largely on the distance to the facilities needed daily, as well as to the quality of basic education, the quality of basic healthcare and the price level of basic commercial goods. The spatial accessibility injustice appear to become more profound with unintegrated and large-size public services like shopping malls, parks and greens, and metro stations, in particular those in specific communities which are remotely located or have very short length of residence. Meanwhile, the injustice they are suffering was more likely related to the quality rather than the quantity of the service. To reduce the specific injustices that social housing residents are confronted with, more attentions should be given to the quality of services, particularly the basic healthcare and education, especially around Tianhe, Baiyun district and new projects. With regard to the connections between job and housing, a majority of residents has changed their workplaces around the relocated living area after resettlement and those residents remaining in their former workplaces would rather face the problem of distant employments. No significant evidence was found to indicate that current residents of social housing are suffering from injustice in relation to their current employment behaviour. As residents are mainly engaged in jobs in basic services with low-skill requirements, it would be very helpful to provide more industries involved in basic services, such as the catering industry, in these areas. Finally, social housing residents appear to be effectively integrated into the local environment. They have also developed a better network within the community, and those aged over age 40, less educated or have a low-income may have a strong dependence on it. The combining of theory results with feasible measurements has substantial implications for understanding the pattern of justice in space and for improving the accuracy of housing policy approaches. Detailed informative and measurement criteria are also beneficial for future research avenues.

## **Key Words:**

Social housing, spatial justice, accessibility to the facilities, job-housing relationship, neighborhoods integration, Guangzhou



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## Executive Summary

**Background.** Social housing refers to institutionally supported housing welfare projects in China. Social housing schemes can be traced back to 1994 and have recently been used to address the residential problems of low- and middle-income households in urban areas. As a pilot city, Guangzhou's intensive construction of social housing blocks was designed to benefit the living conditions of substantial numbers of local families. Despite the substantial benefits, there also appear to be certain unintended consequences such as longer distances from former workplaces. Some residents who move into the new housing projects may give up their jobs or enter a less favourable situation than before. Such trends have drawn wide attention not only from scholars but also from government and the general public. Much research has explored the housing policy system, as well as housing allocation and management. The aim of many studies is to analyse the problems and to provide more opportunities for socially weaker groups. The residents of social housing projects, are such a weaker group in Guangzhou city, such as rural migrant workers, and unemployed and retired urban residents, have weak economic abilities and low political participation. This may affect their location and living environment, and may imply a further lack of socio-spatial resources.

**Objectives.** The objective of this research is to examine whether residents of social housing communities in Guangzhou have experienced any injustices regarding the obtaining of physical resources within the city, or any unjust psychological perceptions. Conceptually guided by the theory of spatial justice, this analysis empirically surveyed the living conditions (including the employment status, travel behaviour and social communication) of 660 residents of 13 social housing communities. The three research dimensions of this study are based on the proposed theoretical structures of spatial justice: territorial distributive justice, economic inequality and locational discrimination. Three empirical questions are then developed to answer them respectively. This threefold interpretation relates to and may contribute to recognising the elements of spatial justice theory. It would also be helpful to reveal whether the perceived (in)justices in relation to people are the results of policy decisions related to distribution or something else (e.g. locational economy driven by market forces). As such, locations may be characterized by the hierarchical service areas proposed by central place theory (Veneris, 1990; Openshaw & Veneris, 2003). This study also looks at whether the spatial layout complies with central place theory, which helps to avoid an exclusive focus on justice issues and a neglect of the rules of the market. The combining of theory results with feasible measurements has substantial implications for understanding the pattern of justice in space and for improving the accuracy of housing policy approaches. Detailed informative and measurement criteria are also beneficial for future research avenues. This study may also provide references for further studies on converting theory into empirical research.

**Data and methods.** This study focuses mainly on three questions relating to spatial justice. The three dimensions are territorial distributive justice of facilities, economic inequality and locational discrimination. Correspondingly, the research attempts to answer the following questions:

- Can residents in social housing communities easily access public facilities?
- Do residents encounter connection problems in accessing workplaces after moving into social housing?
- Do residents experience social segregation or discrimination after living in social housing communities?

Prior to the empirical analyses, the study provides background with a qualitative analysis of the history of housing policy and the development of the social housing system in Guangzhou, and addresses the physical and demographical context of the City of Guangzhou. In Part II on the political and geographical context, Chapter 3 summarises the history of the housing system in urban China after 1949. It chronologically presents the supply structures of different phases and the origin of social housing schemes. Chapter 4 elaborates on various housing types, actors' interactions and operative policies of the social housing system in Guangzhou. Chapter 5 illustrates the background to the case city Guangzhou, and the available data and the methodology. In a description of the case study, the constructive results of social housing blocks and the situations of 13 selected communities are discussed in detail. The data were collected mainly during the survey period in the case city of Guangzhou, and from documented policies, statistics and reports. In addition, the data and methodology presentation provide a specific backdrop to the data sources, data collection, data disposal and applied study approaches.

Part III Operation is the main body of the empirical study on the three questions. The exploration applies quantitative and spatial methods. Quantitative methods include data collection from official statistics and a social science survey prepared by the author. The statistical data comprise the fifth and sixth Census of Guangzhou, and the annual Guangzhou Statistics Yearbook. In collaboration with Sun Yat-sen University, the author conducted a face-to-face survey with 660 respondents from 13 social housing communities. Respondents were asked to indicate their options using a structured questionnaire (see Appendices A.2).

The analysis of the accessibility of facilities (Chapter 6 & Chapter 7) involves mathematical methods and spatial analysis. Travel data are measured mainly by categorical analysis. The depictions of location and the scale of services are carried out by spatial statistical analysis in ArcGIS. Further analyses of the service area are based on spatial interpolation and overlay analysis of layers (e.g. the polyline layers of the urban route system and point layers of service locations and housing locations). Finally, to address the potential influence of residents' satisfaction with accessibility and services, this study utilizes principal component analysis and regression analysis. These approaches were applied to analyse the relationship between job and housing (Chapter 8 & Chapter 9). Spatial description acts as a method to visualize distance and its link to workplace change. To identify the determinants of job change, this study applies logistic regression several times. Information on neighbourhood integration was obtained mainly by analysing answer categories. In exploring neighbourhood integration (Chapter 10 and Chapter 11), measurements were obtained using statistical tools to calculate numbers, frequencies and proportions of categories in a variable and show results by way of tables or statistical figures. Data were sourced mainly from the survey questionnaires (Appendices A.2) and included information regarding social identity, neighbourhood communication, social participation and social trust.

**Study area and case study.** Guangzhou is not only the capital city of Guangdong Province but also one of the three biggest cities in China. Its important administrative, economic and cultural status brought significant changes after 1979. Compared to Beijing and Shanghai, the location of Guangzhou in the Pearl River Delta has resulted in it playing a critical role in the entire southern area of China. The socioeconomic and urban development process in Guangzhou implies specific housing demands and the active provision of housing supply. Therefore, the characteristics discussed below prove it is worth inspecting Guangzhou as a case city with regard to the issue of social housing.

Firstly, demand for housing is intense in Guangzhou but lacks affordability for citizens. Between 1949 and 1998, market-driven housing gradually became the dominant housing type. The collapse of state-owned enterprises and deindustrialisation symbolised the shrinking supply of welfare housing that was based on (numbers of) work units. At the same time, land shortage problems led to a dramatic increase in prices of market-driven housing. Guangzhou is experiencing rapid economic development and socio-spatial restructuring, which have attracted substantial in-flow migration from the surrounding provinces. This movement has generated heavy pressure on housing. The rapid urbanisation of Guangzhou resulted in a gap between housing provision and demand. This called for urgent measures from state administrative authorities. In 2000, per capita living space in Guangzhou was 13.13 sq.m (Guangzhou Statistic Year Book, 2001: Tab.9-6). By 2012, this index was 22.5 sq.m (Guangzhou Statistic Year Book, 2013: Tab.9-5), which still lags behind the average level in China of 32.91 sq.m (China Statistic Year Book, Tab.11-1). Severe demand was accompanied by the low affordability of housing for ordinary citizens. Statistical data show that the yearly income to house price ratio in Guangdong reached 1:6 (see Tab.5.1), beyond the range of developed countries 1:1.8–1: 5.5 (Guo, 2010: 7). This gap between pressing demand and affordability is particularly obvious among the economically weak groups like local low-income families. For that reason, exploring a reasonable housing supply to meet people's demands could shed light on more balanced development.

Secondly, Guangzhou is a pilot city for exploring a (national) suitable social housing scheme. Local government borrows experiences from Singapore, Hong Kong and even European nations, as well as concentrating on increasing the supply of social housing and improving the housing provision structure. As early as 1986, Guangzhou became a pioneer in the construction of social housing. From the early social housing types of JIEKUN and ANJU, to the recent low-rent housing, affordable housing and price-capped housing, the social housing scheme has a long history in Guangzhou (see Chapter 4.2.1). As a front runner, local government has invested large amounts of capital and labour in social housing construction, and consequently, obtains significant quantitative outcomes. According to the statistics of the National Sixth Census, Guangdong has produced 152,911 social housing units (National Sixth Census: 2010: Tab.9-4), 80,670

of them built in Guangzhou city (Guangzhou Statistic Year Book, 2011: Tab.8-9). This number far exceeds those of other big cities in China: 41,767 in Beijing, 14,449 in Tianjin, 19,128 in Shanghai and 42,444 in Chongqing (National Sixth Census: 2010: Tab.9-4). The number of guaranteed household units grew from 10,000 before 2007 to over 134,000 by 2013 (Guangzhou Bureau of Land Resource and Housing, 2013). This remarkable achievement by Guangzhou has attracted nationwide attention and has provided references for social housing construction in other cities of China.

Thirdly, the 13 selected communities were constructed with different types. By 2014, 52 social housing projects had been established, of which 20 were completed and allocated to targeted groups (Guangzhou Bureau of Land Resource and Housing, 2014). Owing to limited land reservation and changing policy directions, built-up social housing communities have different characteristics in terms of their scale, location and mixed modes of housing types. These features of communities may imply different degrees of spatial injustice. For example, centrally located residents may experience less injustice in terms of ease of access to public services while mixed dwelling mode communities may reduce neighbourhood segregation. In order to identify such influences, this study selected 12 completed social housing projects and one “transferred” (see Chapter 1.5 and Tab.5.6). Analysing communities with specific features as well as their common traits may yield insights for improving social housing development.

**Findings.** This study examined three topics in response to whether the residents of social housing communities in Guangzhou have experience of spatial injustice. Correspondingly, we list the main findings below:

- Residents of social housing communities are located quite near the everyday facilities required (e.g. basic medical facilities, nursery and elementary schools, convenience markets and a public transport station). They may not experience injustice in accessibility. Secondly, residents of communities in peripheral locations (in the districts of Tianhe and Baiyun) may suffer from certain injustices in accessing facilities: medical facilities, middle schools, shopping malls, parks and metro stations. Residents of communities located in areas close to the city centre have easy access to these facilities (medical facilities, middle schools, shopping malls, parks and metro station). They can access sufficient services in a short time by an easy travel mode and they show higher satisfaction. Those in communities in peripheral locations, they not only show difficulties in reaching facilities, but also have lower satisfaction. Residents’ assessments of service facilities depend greatly on their proximity to facilities needed every day, and also relate to the quality of basic education, the quality of basic health care and the price of basic commercial goods.
- Retirement may be a main reason for the low employment rate in social housing communities in Guangzhou. The lower educational backgrounds of social housing residents would limit the available work opportunities to basic services with lower skill requirements.
- No significant evidence indicates that current residents in social housing are suffering from injustice in their current employment behaviour. However, after moving into social housing, many of them did indeed experience inconvenience in the beginning in accessing jobs or opportunities.
- Working in a stable job may greatly reduce the possibility or intentions to change jobs in terms of location or occupation, even if residents should experience some difficulties in commuting. In contrast, long distances or inconvenience in reaching the workplace may increase the probability or intentions of finding a new workplace near the housing. However, changes in occupations may not relate to a changed spatial connection between job and housing caused by moving into social housing, but may be more associated with the wage level, social network and personal interests.
- No psychological exclusion exists. Social housing residents appear to be highly integrated into the local environment. They have developed better networks within the community, and those who are over the age of 40, who are less educated or who have a low income may have strong dependence on them.

### **Implications.**

This study refers to a theoretical review, policy study, quantitative methods and qualitative analysis. To summarize all discussions in the theory part, policy part and empirical study, we would like to further indicate the innovative points

proposed by this study, as well as the implications for subsequent research and recommendations that may be helpful for practice.

The first innovative point of this study is the way of interpreting theoretical principles in the topics of empirical study. Past studies have widely discussed spatial justice from a theoretical perspective, or examined on only one specific topic (e.g. distributive justice of healthcare) in an empirical study to respond. However, this research may not be enough to satisfactorily conclude whether the targeted group may suffer spatial injustice when living in a place. Therefore, this study seeks to provide a comprehensive explanation for this theory. The structure may shed some light on further empirical research on a defined population group. Additionally, this study also proposed an index system for examining neighbourhood integration (see Chapter 10). By summarizing past research on relative topics of integration, neighbourhood integration here contains concepts of social participation, social communication, sense of community, social cohesion and residential satisfaction. Reviews of past studies and newly formed structures may also serve to provide some ideas for future research.

Secondly, this study also offers some implications for practice. According to the main findings of empirical studies, two practices may be helpful for improving the extent of the justice or inconvenience that the residents experience. The one is to improve the quality of basic healthcare and the quality of education. The other is to provide more industries providing basic services, such as catering industries.

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## **Part I**

### **Introduction and Conceptualization**



# 1 Introduction and conceptual background

## 1.1 Research theme and conceptual design

The main aim of the study is to find out whether residents of social housing projects and communities experience an issue with spatial injustice with respect to accessing necessary physical and social infrastructure and what their personal perceptions are in this respect. Conceptually guided by the theory of spatial justice and empirically based on surveys, this analysis has empirically tested the living conditions (including employment status, travel behaviour and social communication) of 660 residents from 13 social housing communities. Social housing refers to institutionally supported housing welfare projects in China. It can be traced back to 1994 and research has recently focused on urban residential difficulties among low- and middle-income households in urban areas. As the pilot city, Guangzhou's intensive construction of social housing blocks was designed to benefit the living conditions of substantial numbers of local families. Although the benefits have been largely substantiated, there also appear to be certain unintended effects such as longer distances to workplaces which have led to some residents of new projects giving up their jobs and experiencing a less favourable situation than before moving into such housing. Such developments have attracted wide attention not only by scholars, but also by government and the general public. Much research has explored the housing policy system, and housing allocation and management. Some studies have endeavoured to analyse living conditions from different angles, such as the accessibility of public services, commuting behaviour, occupational levels, social networks within neighbourhoods and so on. The aim of these interdisciplinary studies is to analyse and achieve more opportunities for socially weaker groups. Residents in social housing projects are such weaker groups in Guangzhou city, as rural migrant workers and unemployed and retired urban residents, have weak economic abilities and low political participation, and this may affect their location and living environment, and may imply a further lack of socio-spatial resources.

The concept of spatial justice stems from social justice theory, which is a new way of thinking on the search for social justice from a spatial perspective (Harvey, 1973: 96; Soja, 2010a: 1). With reference to a spatial turn in the principles of social justice (Harvey, 1973: 107-108; Soja, 2010a: 47), two main dimensions of spatial justice may be concluded: the first dimension draws on the physical redistribution of common goods, social needs and geographical resources. The second dimension stresses spatial results by reason of processual justice. How does the decision-making process address issues of residential segregation and neighbourhood integration? This study makes use of the proposed principles (Soja, 2010a; Marcuse, 2009b) to estimate spatial justice according to the following dimensions: territorial distributive justice, economic inequality and locational discrimination.

**Territorial distributive justice.** Distributive justice has the characteristic of being easily visualized. This concept is the first dimension proposed in the discussion about the justice of space. Territorial justice is commonly understood as the even allocation of the common good with respect to social needs within a certain area and implies that people have equal access to opportunities (Harvey, 1973: 101). This concept mainly examines the evenness of geographical effects caused by the distribution of public services (e.g. health services, education, transport, police and crime prevention, housing and employment). Other scholars have suggested the importance of considering "social needs". Their studies have developed quantitative indicators (Davies, 1970: 215; Coates, Johnston & Knox, 1977). Territorial distributive justice as a topic may be examined from both an emic and an etic aspect, that is, from both the objective, factual situation provided by space and the personal perceptions thereof. In this sense, judging whether the distribution represents justice or injustice, or is perceived as "just", should be based on the spatial outcome of services, travel connectivity between residential location and service point, as well as the personal satisfaction with the current provision.

**Economic inequality.** In the perspective proposed by Lefebvre (1968) about "the right to the city", achieving justice should be seen as both the outcome and the process of distribution and redistribution (Purcell, 2002: 102). In this sense, the everyday activities of urban functioning (e.g. economic performance, political participation, social networking) may result in dynamic inequality or unjust conditions. Everyday activities, as the most prominent economic activity, directly influence the individual's locational decisions and capitalist accumulation, and may further cause reduced or aggravated redistributive injustice (Soja, 2009: 3). Several scholars have suggested significant perspectives in their conceptualized

systems for identifying economic inequality. One widely used concept in defining spatial relationships between work and residence is the spatial mismatch hypothesis (SMH) (Kain, 1968: 180; Holzer, 1991; Orfield, 1999: 37; Galster & Killen, 1995; Galster & Mikelsons, 1995). This hypothesis considers both geographical matching (job access & job proximity) and opportunity matching (accessibility of labour markets or suitable jobs) (Ihlanfeldt & Sjoquist, 1989; Stoll, 1999). Therefore, the examination of economic injustice entails two topics: one is the employment situation of residents in social housing, and the other is the supposed commuting and access difficulties brought about by the living location in economic participation. The changes that happened after resettlement in social housing, both in commuting behaviour and on an occupational level, would be used to elaborate redistributive (in)justice in the economic realm.

**Locational discrimination.** Besides the aforementioned spatial outcomes, the location also results in social effects or social attitudes. In his theoretical framework for spatial justice, Soja (2009: 3) interprets a negative socioeconomic phenomenon as locational discrimination; other studies have viewed this from the angle of residential segregation (Cheshire 1979b; Ihlanfeldt & Sjoquist 1989: 122). The negative social outcomes have been explored in topics such as social polarization, social bias along class, race and gender lines, residential segregation and marginalization (Kain, 1968: 196; Ellwood, 1986; Leonard, 1986; Stoll, 1999). The social housing community within which people with weak economic ability concentrate has been presumed or verified as the geographical unit with a high risk of residential segregation from the outside social environment (Logan, 2003: 38; Squires & Kubrin, 2005: 47; Galster, 2005: 124). However, when defining what social effects the residents' experience, it is important to clearly identify conditions within or outside the residential unit. With respect to the application of theory (residential segregation, neighbourhood integration, social cohesion etc.), several concepts (e.g. social communication, social participation, sense of community, residential satisfaction) have made contributions to measuring social effects with feasible indices. With respect to outcomes, either theoretical or methodological, the study conceptualizes a structure using detailed indicators to document whether or not residents are socially segregated either within or from outside their residential units.

## 1.2 Relevance

While many studies are devoted to the emergence of Guangzhou as a global city, this study seeks to understand the emergence of "landscapes of poverty" (Seabrook, 1985; Gonzalez & Viviani, 2011: 2) during this urbanization process. Accurate, in-depth views of locational features of low- and middle-income families, who are one of three main poverty groups in Guangzhou, have direct importance for understanding urban spatial justice from social, economic, resource and policy aspects. By employing the theory of spatial justice, using both statistical methods to depict spatial urban social structures and visualization approaches to demonstrate geographic-locational features, the study is relevant with respect to the following aspects:

**Theoretical relevance.** Spatial justice is a helpful concept to guide the research theme. Following the interpretation of Soja (2009: 2-3), the model of spatial justice is a way of seeing both process justice and the outcomes of justice from a spatial perspective. Main propositions are elaborated from these dimensions: the territorial distribution of resource organized by political power or market forces, social biases raised by location, and lastly, how normal mechanisms affect distributive outcomes. To summarize broad discussions on spatial justice, three key concepts emerge. These are territorial justice, economic inequality and locational discrimination. The first two concepts originate from the distributive outcomes of services and economy-related opportunities, while the third concept draws on processes related to location, education and the personal beliefs of individuals with respect to social changes. Based on core meanings, three critical topics – accessibility to public services, job–housing relationships and neighbourhood integration– are used to capture and document issues of spatial justice. This threefold interpretation relates to and may contribute to recognizing elements of spatial justice theory. In addition, the distribution of resources is not only a policy decision, but also market-driven. As such, locations may be characterized by hierarchical service areas proposed in central place theory (Veneris, 1990; Openshaw & Veneris, 2003). This study also looks at the spatial layout, taking account of the rules of central place theory to avoid biased results that focus exclusively on justice issues and neglect the rules of the market. To combine theory results with feasible measurements has substantial implications for understanding the pattern of justice in space and for improving the efficacy of housing policy approaches. Detailing informative and measurement criteria is also beneficial for future research avenues. This study may provide references for further studies on converting theory into empirical research.

**Methodological relevance.** For reasons of privacy, official statistics lack resolution of microeconomic data on individuals, which impedes the analysis of outcomes of housing policy or real market-driven housing activities. This study fills this lacunae by employing survey data comprising details of individuals' income of and their employment situation which were obtained by means of personal interviews and in-depth questionnaires with a sample of residents. The majority of the accessibility issues are evaluated by metrical distance utilizing spatial tools. In addition to spatial analysis at the city level, survey data also support statistical analysis at the community level. This enables an understanding of spatial justice from both the perspective of the objective situation and of subjective perceptions. Investigations of the job–housing mismatch and of neighbourhood integration utilize quantitative methods (i.e. cross-sectional analysis, regression analysis) as well as spatial visualization of individuals' information. When statistical analysis reveals phenomena using numbers, percentages and correlations, visualization of individual-based data by means of spatial tools provides a direct view of that situation.

**Strategical relevance.** Firstly, outcomes derived from spatial justice analysis depict the geographic patterns of justice: ease or difficulty of access to facilities and to job opportunities, social segregation, and discrimination or acceptance. Secondly, the potential influence of spatial justice may be useful for adjusting current policy strategies and localized practices. Social housing is a policy-based welfare project in the cities of China. Administrative power conducts or indirectly guides the process from decision-making, to policy design, to the construction and allocation of housing. Explaining who the actors are and what processes and mechanisms operate the housing policy system helps us to identify possible deficiencies that may result in unjust outcomes. Consequently, discussions in turn shape the decision-making process and the functioning of organizations.

The spatial appearance of the resource/infrastructure environment, using measures of access to public services, to the workplace and to the labour market, can demonstrate the physical situation. Based on this, survey-based statistics expose individuals' expectations towards services and job opportunities. The joint analysis of real situations and subjective demands may suggest to local managers ways in which their allocation strategy may be modified. A study on a neighbourhood level offers rich evidence of communities' functioning and internal conflicts. Lessons of different social housing communities may be helpful to discover appropriate ways to organize housing, residents and public space in residential units. In conclusion, exploring spatial justice has significant practical implications, as revealing and identifying potential problems can improve strategies for both the institutional and the operational parts of the social housing system.

### 1.3 Research questions and hypotheses

**Research questions.** The main aim of this study is to classify existing spatial injustice if it exists and to identify its effect on the residents' living conditions. The research questions are designed along three conceptual strands: territorial distributive justice, economic inequality and locational discrimination.

#### **Question 1: Can residents in social housing communities easily access public facilities?**

The distribution of infrastructure facilities is a result of spatial resource organization. Since the spatial distribution of required infrastructure facilities is influenced by political arrangements and market forces, resident location in different social housing communities may imply differential access to such resources. Access to facilities can be identified by geometric distance, travel time, access opportunity and the richness of resources in certain areas. The targeted group of this study is the economically weak population in Guangzhou residing in social housing communities, and the major part of this population segment has been assembled in social housing projects in underdeveloped land parcels. People living in such areas may experience longer time spent travelling to health services, qualified education and working opportunities than other citizens. Inequalities may have negative effects on the healthy development of the community and also on urban functioning.

By using data on travel to nine facilities required daily (i.e. nursery and elementary schools, meat and food markets, convenience supermarkets, bus stations, health services, middle schools, shopping malls, parks, and metro stations), this study seeks to ascertain whether residents have more difficulty in reaching public facilities. Firstly, the distance travelled to access the facility is examined, not only in terms of geometric distance on the urban route system, but also

in terms of the perceived distance expressed in survey answers. Then we attempt to identify effects by way of comparing the accessibility results of 13 communities. The different construction forms (i.e. time of construction, location, population size and mixed type) of the 13 projects may affect spatial arrangement (number, size and location of settings) carried out by political power, and may also reflect the market-driven layout of commercial services.

Nevertheless, it is important to be clear that differences in accessibility do not in themselves mean the existence of spatial injustice. Firstly, spatial allocation of facilities is decided both by political arrangement and by the consumer environment. As proposed by central place theory (Christaller, 1933, Brush, 1966: 187), the location of the activities may rely on the grade of service and its service area. There is a hierarchical structure to services (Veneris, 1990; Openshaw & Veneris, 2003) that follows the general rule that the higher the level of centrality of a place/facility/service or good and the less densely they are spread out over an area (but rather at central locations), the larger is their required market area and as a result, such centrally located and crucial facilities may be less accessible for those living far away or at the periphery. Therefore, the access to facilities at higher levels (e.g. high-class educations, metro stations, shopping malls and key hospitals) could be more difficult when compared to facilities for everyday needs that are at the lower level of the central place hierarchy, but more widely and densely spread. Secondly, distributive injustice is not just a concept referring to physical results but also relates to personal needs. It is therefore necessary to ascertain whether current accessibility meets individual demand. In conclusion, identifying the experience of possible distributive injustice among residents in social housing should be based upon three aspects: their physical connectivity, the grade of service and the level of satisfaction expressed.

**Question 2: Do social housing residents experience problems of connecting easily with and accessing their workplaces after having moved into social housing?**

In accordance with redistributive injustice, economic activity is the main factor that affects resource reallocation. Participation in employment, connections between job and housing as well as commuting behaviour not only indicate the distributive outcomes of economic activity influenced by residential location, but also reflect on the redistributive process leading to a new job–housing relationship. Social housing communities display concentrations of groups with inadequate abilities in socio-economic, physical or political aspects. These households consist of low-income families, poor families, households with reduced mobility, single elderly, families of war heroes and some lower middle-income families. Prior to an examination of the job–housing relationship, it is important to know the employment status of the persons surveyed, the working environment around their place of residence and the availability of suitable opportunities in close proximity. Then one can analyse the situation pertaining to job–housing connectivity after moving into a new residential (social housing) location. Are persons able to access their former workplace easily? Has the commuting distance and commuting time increased or decreased with the change in living location? Answering these questions can give clues about the job and housing relationship. In addition, the job–housing relationship is not a stable phenomenon, but a dynamic process that relates to individuals' decisions. How residents assess their experienced connections between place of work and place of residence may result in how they respond with real actions. If people change or have strong aspirations for a new spatial relationship between job and housing, what factors may affect their reorganizing behaviour? The survey data from 13 communities provide the possibility to examine influences by means of statistical analysis.

**Question 3: Do residents experience social segregation or discrimination after living in social housing communities?**

Concepts of spatial injustice hold the notion that locational discrimination may be an important element since the concentration of residents from vulnerable groups may result in excluding that community from normal social networks and surrounding society. Most social housing communities are situated in places distant from the city centre. Newly built large-size communities show distinctly different residential patterns in suburban areas compared to closer and more centrally located social housing communities. There is a possibility that the concentrated residences of weak groups meet lack acceptance from surrounding residential communities. Homogeneity within the unit and heterogeneity with respect to the surrounding residential areas would tend to strengthen a “ghetto effect”, i.e. the emergence of separate a community and an inadequately integrated people. The integration of neighbourhood includes three dimensions: physical integration, social integration and psychological integration (Aubry & Myner, 1996: 10; Ecker & Aubry, 2016: 111). Testing of the first two research questions will address the aspect of physical integration, and the

third question mainly focuses on social and psychological integration. The examination of social integration aims at understanding participation in political (communication with institutional agencies, police, media etc.) and sociocultural activities (cultural exchanges, recreation, outdoor leisure, volunteering etc.), contact with neighbours and outsiders in the community. Regarding psychological integration, we try to identify by means of a survey emotional dependence, feelings of belonging to the community and willingness to have a long-term stay. However, the study also explores whether the urban form (the form of the community such as location, building time, size and housing mix) or personal attributes of the residents (age, education, income etc.) have effects on neighbourhood integration.

Answering questions from three dimensions can assist in an understanding of whether distributive injustice, economic injustice and discrimination are perceived by residents of social housing, or whether they are indeed emerging. Findings on accessibility to public services, employment behaviour and integration into social functioning address main notions of the conceptualization of spatial justice. In accordance with the above research questions, we postulate the following hypotheses:

**Tab. 1.1 Research questions of the study**

Main research theme		
To ascertain whether residents in social housing are experiencing distributive injustice (unequal opportunities to socioeconomic resources) or spatial discrimination (neighbourhood excluded by social environment and separation within community).		
Research questions	Sub research questions	
Can residents in social housing communities access public facilities easily?	Territorial distributive justice	<ul style="list-style-type: none"> <li>• On which service level are the nine facilities?</li> <li>• What is the distance between the residential location of social housing and the nine facilities?</li> <li>• In comparison with other citizens, do inhabitants of social housing enjoy equal access?</li> <li>• Do any differences exist between residents in the 13 communities with regard to access to public facilities? If yes, what are the reasons for the differences?</li> <li>• Will access to facilities meet the demands of the residents of social housing?</li> </ul>
Do people experience serious job–housing mismatch problems after moving into social housing?	Economic inequality	<ul style="list-style-type: none"> <li>• Does resettlement in social housing have any effects on the employment rate of residents? Do residents anticipate working after moving into social housing?</li> <li>• Can residents easily access various job opportunities? What is the working environment in like in the vicinity?</li> <li>• Can residents access their workplaces easily? After living in social housing, what changes were experienced in terms of commuting distance and commuting time? Did they increase or decrease?</li> <li>• How do residents assess connections between job and housing?</li> <li>• If people change or have strong aspirations for a new spatial relationship between job and housing, what factors may affect their reorganizing behaviours?</li> </ul>
Do the residents experience social segregation or discrimination after resettling in social housing communities?	Locational discrimination	<ul style="list-style-type: none"> <li>• How often does an individual interact with neighbours within the same community and in nearby residential areas?</li> <li>• How often do residents participate in political and sociocultural activities?</li> <li>• Are residents psychologically satisfied with the current social connections? Are they willing to stay longer?</li> <li>• What factors may affect the integration of residents in social housing communities?</li> </ul>

Source: own draft, 2018.

**Hypothesis 1: Multilevel housing provision structure and a mixed residence mode may reduce spatial injustice.**

Most of social housing projects are located in underdeveloped city areas, making it hard to make up for the loss of social networks people once depended on in old city areas. This study presumes that the operation of social housing schemes may result in injustice in terms of space. Residents are assumed to have increasing problems of social

separation hindered by the relationship with the old environment and undeveloped or inadequate acceptance at new location. The heterogeneity of the social housing community in a new place may increase the risk of segregation. As the concentration of vulnerable people increases, heterogeneity in the neighbourhood may increase. Supplying social housing in a multilevel form means a greater mix of people with different economic abilities in a community. At the same time, the distinctions between the placed residents and surrounding citizens would reduce to some extent. Thus, we assume multilevel housing provision and a mixed residential mode may produce positive effects in terms of spatial justice.

**Hypothesis 2: People in social housing communities have lower access to facilities and employment, and they may be experiencing social exclusion to some extent.**

Marginalized location, distance to core resources, and an underdeveloped transport system may jointly result in reduced access to health services, education, the commercial environment and the labour market. With respect to accessing very basic needs like markets and nursery and primary education, we assume that the situation in social housing communities is satisfactory. However, they may lack access to higher-level services (health services, middle schools, metro system, shopping malls etc.) which plays a critical role in subsequent development. At the same time, this may weaken the performance of economic activities and the social networks of social housing residents, which may in turn result in (more) social segregation and even impoverishment.

**Hypothesis 3: Subjective recognition by surveyed residents of aspects of spatial injustice (difficulties accessing facilities and workplaces, social segregation) may lessen if or because they have low expectations of physical goods and social acceptance.**

The study examines aspects of spatial justice objectively, as well as from the perspective of subjective satisfaction with respect to the accessibility of services and jobs, and the perceived degree of social integration. Generally, economically weak groups may have lower expectations of physical public goods, particular higher-level services. Fewer services in the vicinity of social housing compared to other residential communities may perhaps not cause severe dissatisfaction among surveyed people, as long as their basic needs are fulfilled. At the same time, similarity in terms of social status, economic ability and personal beliefs may strengthen the surveyed people's dependence on social networks within their community. They might then be satisfied with their current situation, have a high acceptance of it and feel no particular willingness or need to be integrated into the social environment outside of their own community.

## 1.4 Data and methodology

This study is based upon the concept of “spatial justice” and explores three questions: accessibility to infrastructural facilities, the job–housing relationship and neighbourhood integration. The exploration makes use of quantitative and spatial methods. Before discussing the empirical analyses, the study provides background using qualitative analyses of the history of housing policy and the development of the social housing system in Guangzhou, and addresses the physical and demographical context of the City of Guangzhou.

**Quantitative methods.** This empirical investigation of the phenomenon spatial (in)justice is primarily based on statistical techniques, mathematical models and spatial analysis. Firstly, the quantitative methods used in data collection are official statistics and a social science survey prepared by the author and carried out in collaboration with Sun Yat-sen University. The statistical data contains the fifth and sixth Census of Guangzhou, and the annual Guangzhou Statistics Yearbook. The survey was carried out face to face with 660 respondents from 13 social housing communities. Respondents were required to answer respond to items in structured questionnaires (see Appendices A.2). Secondly, mathematical methods applied to organize the numerical data include category data analysis with single or double variables, binary logistic regression analysis and factor analysis using the tools SPSS and EXCEL. Measurements by mean of statistical tools to calculate numbers, frequencies and proportions of categories in a variable and show results by way of tables or statistical figures. Similarly, several categorical analyses contain two variables and utilize cross tabulations. Thirdly, another important quantitative method used in this study is spatial analysis, which refers to numerical calculation runs and displays them in space. Spatial analysis is achieved using ArcGIS and methods such as spatial characterization, spatial statistical analysis, spatial interpolation and overlay analysis are used. The use of spatial characterization aims to build up the base dataset. The research area, the administrative area of the district and



the sub district, urban route system, location of housing and workplace, and the service points of facilities, are visualized separately in layers (point, polyline and polygon).

Analysing the accessibility to facilities (Chapter 6 & Chapter 7) involves mathematical methods and spatial analysis. Travel data are mainly measured by categorical analysis. The depiction of location and the scale of services is carried out by means of spatial statistical analysis in ArcGIS, and further analyses of the service area are based on spatial interpolation and overlay analysis of layers (includes the polyline layers of the urban route system, and point layers of service locations and housing locations). Finally, for addressing the potential influence of residents' satisfaction with access and services, the study utilized principle component analysis and regression analysis. The same approach was applied to the analysis on the relationship between job and housing (Chapter 8 & Chapter 9), while commuting data were estimated by analysing data categories. Spatial description acts as a method for visualizing distances and changes of workplace. For identifying the determinants of job change, this study applied logistic regressions several times. Facts related to neighbourhood integration were based mainly on an analysis of the questionnaire responses. In exploring neighbourhood integration (Chapter 10 and Chapter 11), measurements were made using statistical tools to calculate numbers, frequencies and proportions of categories in a variable and results are displayed by way of tables or statistical figures. Data on social identity, neighbourhood communication, social participation and social trust are sourced mainly from the survey questionnaires (Appendices A.2).

**Qualitative methods.** This study has widely applied qualitative methods in collecting non-numerical data, reviewing the literature and constructing the theoretical framework (Chapter 2), describing the history of housing policy and housing development in China (Chapter 3) and the social housing system in Guangzhou (Chapter 4) and the Guangzhou study area (Chapter 5). As such, various qualitative methods to contextualize the topic of housing guide the empirical analysis, as does a thorough conceptualization of theory, which extracts elements for the empirical study. In the data collection phase, the main methods used are in-depth interviews with experts, policymakers, managers and residents of social housing, and instant recording (photography, occasional talks with people living in social housing) during fieldtrips. Three fieldtrips were carried out in January 2013, August and September of 2013, and September of 2014. The interview held in first fieldtrip is a pilot test, which aimed at preparing data for the questionnaire and the formal interviews. The interview was semi-structured in design, where questions were proposed that elicited open answers only. This mode contributed to providing rich references as well as policy background and contextualization. In-depth interviews played important role during the second fieldtrip. During fieldtrips, visual ethnography was used as a supplementary way of collecting instant information using notes and photography. At the same time, official statistics and documents (see Appendices A.1) were gathered, 48 in-depth interviews (see Appendices A.3) were conducted and a case study of 13 communities with prompt information and photos was conducted.

## 1.5 Case city: Guangzhou

Guangzhou is not only the capital city of Guangdong Province, but is also one of the three biggest cities in China. Since 1979, its important administrative, economic and cultural status has brought significant changes. Compared to Beijing and Shanghai, Guangzhou is located in the Pearl River Delta and thus plays a critical role in the entire southern area of China. The socioeconomic and urban development process of Guangzhou implies specific housing demands and that active provision of housing. Therefore, the characteristics shown below prove it is worth investigating Guangzhou as a case city with regard to the issue of social housing.

**Intensive housing demands and deficient affordability.** Guangzhou is experiencing rapid economic development and socio-spatial restructuring, which have attracted substantial in-flow migration from the surrounding provinces. This movement has brought an abundant labour force to the city, but has also generated heavy pressure on housing. In 1998, a great change took place in housing provision as market-driven housing gradually became the dominant housing type and totally replaced the welfare housing system which had functioned between 1949 and 1998. The collapse of state-owned enterprises and deindustrialization symbolized the shrinking supply of welfare housing that was based on (numbers of) work units. At the same time, land shortage problems led to dramatically rising prices in market housing. Guangzhou, as one of the biggest cities and undergoing rapid urbanization, experienced a gap between housing provision and demand, and this called for urgent measures from the state administration. In 2000, per capita living

space in Guangzhou was 13.13 sq.m (Guangzhou Statistic Year Book, 2001: Tab.9-6), in Beijing it was 11.14 sq.m (Beijing Statistic Year Book, 2001: Tab.18-2) and Shanghai 11.03 sq.m (see Tab.5.2). These data at the national level were separately calculated by urban and rural area: 10.3 sq.m and 24.8 sq.m (China Statistic Year Book, 2001: Tab.10-27). By 2012, the Guangzhou index was 22.5 sq.m (Guangzhou Statistic Year Book, 2013: Tab.9-5), which still lagged behind the average level of China at 32.91 sq.m (China Statistic Year Book, Tab.11-1).

Severe demands were accompanied by the low affordability of housing for ordinary citizens. Statistical data show that the yearly income to house price ratio in Guangdong reached 1:6 (see Tab.5.1), far in excess of the range of developed countries 1:1.8–1: 5.5 (Guo, 2010: 7). This gap between pressing demand and affordability is particularly obvious among economically weak groups such as local low-income families. For that reason, exploring reasonable housing supply to meet people's demands can make sense for more balanced development.

**Guangzhou is a pilot city for a multilevel social housing scheme.** Guangzhou is a pilot city in China for identifying a (national) suitable social housing scheme. Local government has drawn lessons from Singapore, Hong Kong and even European nations in concentrating on increasing the supply of social housing as well as improving the structure of housing provision. As early as 1986, Guangzhou became a pioneer in the construction of social housing. From the early social housing types of JIEKUN and ANJU, to recent low-rent housing, affordable housing and price-capped housing, social housing schemes have a long history in Guangzhou (see Chapter 4.2.1). As a front runner, the local government has invested large amounts of capital and labour in social housing construction, consequently obtaining significant quantitative outcomes. According to statistics of the National Sixth Census, Guangdong has produced 152,911 social housing units (National Sixth Census: 2010: Tab.9-4), 80,670 of which have been built in Guangzhou city (Guangzhou Statistic Year Book, 2011: Tab.8-9). This number far exceeds the numbers in other big cities in different regions: 41,767 in Beijing, 14,449 in Tianjin, 19,128 in Shanghai and 42,444 in Chongqing (National Sixth Census: 2010: Tab.9-4). The number of guaranteed household units grew from 10,000 before 2007 to over 134,000 by 2013 (Guangzhou Bureau of Land Resource and Housing, 2013). This remarkable achievement on the part of Guangzhou has attracted nationwide attention and has provided references for social housing construction in other cities in China.

**Thirteen selected communities organized in different ways.** By 2014, 52 social housing projects had been established, and 20 of them had been completed and allocated to targeted groups (Guangzhou Bureau of Land Resource and Housing, 2014). Due to limited land availability and changing policy directions, the social housing communities built have different characteristics regarding scale, location and mixed modes of housing type. These features of communities may imply different degrees of spatial injustice. Centrally located residents may experience less injustice in terms of ease of access to public services, while mixed dwelling mode communities may in addition reduce neighbourhood segregation. In order to identify such influences, this study selected 12 completed social housing projects and one “transferred”, i.e. privatized social housing project, Likang, as study cases. Zede, Tangde and Jude are the three oldest social housing projects and were extended in an accelerated phase after 2000. Housing types included contain ANJU housing, low-rent housing and affordable housing. Jinshazhou, Fanghe and Guangdan are three typical large-scale projects built between 2005 and 2008. Jide, Anxia, Tai'an and Guocun are four small-scale projects built during the same period with around 1000 housing units. Dang'en and Huize Yaxuan are two small communities with a single affordable housing type, while Likang is one of eight transferred communities with private ownership. Analysing communities with specific features as well as common traits may yield insights into how to improve social housing development.

## 1.6 The structure of the thesis

This thesis is divided into four main parts (see Fig. 1.1):

**Part I Introduction and conceptualization:** Chapter 1 contains the introduction, Chapter 2 the theoretical framework of spatial justice. The introduction gives an overview of research structure of the study and elaborates on the theoretical framework, the research questions and the operationalization of the empirical study. The following chapter focuses on details of the concept of spatial justice. By inducing the conceptual structures proposed in various discussions, this study suggests an appropriate conceptual structure to support further research.

**Part II Political and geographical context:** Part II consists of policy analysis and a case statement. **Chapter 3** focuses on the housing system of China after 1949. It presents chronologically the supply structures of different phases and origin of the social housing scheme. The discussion in **Chapter 4** elaborates on housing types, actors' interactions, and the operative policies of the social housing system in Guangzhou. **Chapter 5** illustrates the background of the case city Guangzhou, the available data and the methodology. In descriptions of the case study, constructive results of social housing blocks and conditions in 13 selected communities are discussed in detail. In addition, the presentation of the data and methodology provides a specific backdrop against which the data sources, data collection, data disposal and applied study approaches may be viewed.

**Part III Empirical study:** Based on the theoretical structure, this part interprets three conceptualized dimensions into concrete research questions and includes three topics. **Chapter 6** and **Chapter 7** aim to present distributional injustice by addressing the issue of "accessibility to public services". Geographic accessibility is measured by means of travel time, travel cost and travel mode as indicated by the people surveyed. Accessing effective resources is examined by measuring the geometric distance and considering the servicing ability of facilities. **Chapter 8** and **Chapter 9** deal with redistributive injustice across the research area. By means of statistical analyses, details of the relationship between job and housing can reflect how easy or difficult it is to access jobs. In order to demonstrate this accurately, we explored employment status, occupational level, commuting behaviours and the occurrence of job relocation using the survey data. Finally, job relocation behaviour was regressed with individual data, household features and job features, with the aim of discovering effective influences. **Chapter 10** and **Chapter 11** deal with social exclusion issues. The fundamental concept for the empirical study is neighbourhood integration, the connotation of which has been largely broadened in past discussions. This study summarized two dimensions – social integration and psychological integration – and examined with indicators social participation, interpersonal communication, sense of community and residential satisfaction.

**Part IV Conclusion:** This part summarizes the findings of the empirical studies conducted in Part II and Part III. The most important results regarding accessibility, the job–housing relationship and neighbourhood integration will be processed in detail in **Chapter 12**. Drawn from the study process, conclusions will address the innovativeness of research methods and limitations, and furthermore give implications for institutional structure and operative strategies.

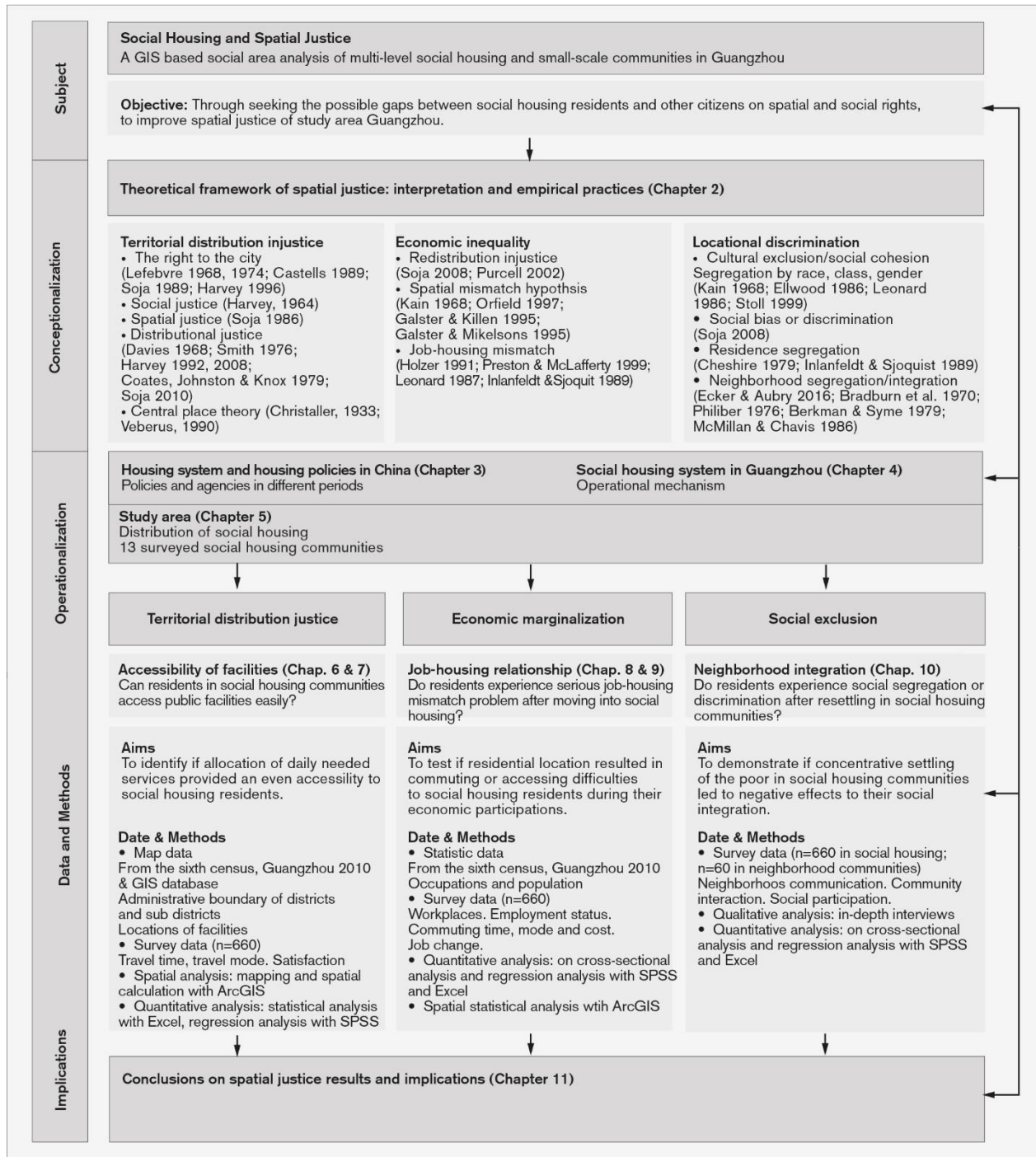


Fig. 1.1 Research design of the empirical study

Source: own draft, 2018.

## 2 Theoretical reviews and structuring

This literature review section aims at 1) laying a sound theoretical foundation of spatial justice concepts, and 2) discussing the applications of certain theories to conceptualize spatial justice phenomena. The first aim is of particular importance, since the theories related to justice may be overlapping and interdisciplinary and empirical geographical studies may not be sufficient or conclusive. The second aim offers an overview of theory development over time and the contexts within which these principles are established. This review starts by distinguishing the terms used in many empirical studies, namely, equity (equality), fairness and justice. Despite similar meanings, these terms still have very different origins and reflect different principles. Precise use of the concepts will be achieved by resorting to explicit definitions and by elucidating the contexts behind each concept. The review then demonstrates the prominent theories on justice issues in earlier times. The construction of theories based on rationally defined political, moral and social contexts are also discussed. Afterwards, the review focuses on the development and current applications of justice in space. This theme revolves around a number of core questions: a. how can spatial justice be promoted? b. What principles of justice can be transferred to the theoretical frameworks of spatial justice? and c. What principles have been successfully adopted and applied in other empirical studies? To conclude this review, only the relevant principles of spatial justice that address the actual problems faced by social housing residents are summarized from the interdisciplinary body of literature.

### 2.1 Equity, fairness and justice

The terms “equity”, “equality”, “fairness” and “justice” (EFJ) are used in many research articles on social and distributional issues. A common problem is that these terminologies are considered interchangeable and are often used imprecisely. Hence, understanding the background and development of each term would be helpful in identifying their key differences. As an example, the work of Hay (1991, 1995) defines these terms according to their original contexts, applied areas (research from political, philosophical, legal, socioeconomic and spatial perspectives among others), dimensions and methodologies. This section first recounts the original philosophical, ethical, political and socioeconomic contexts in which the concepts were proposed and developed. A brief description of the application and extension of such concepts is then provided, in order to account for their differences. Thus, proper and precise terms will be extracted for this study.

#### 2.1.1 Identification of relevant terms “equity”, “justice” and “fairness”

**Equity and equality.** The term “equality” originated from the notion of “egalitarian” (Pojman & Westmoreland, 1997: 1). Based on the fundamental concept of “egalitarianism”, achieving social justice is a process of creating a just social arrangement. Thus, Smith (1994: 118) views justice as a reduction of inequality and a restoration of equality. In this sense, justice is assumed to mean the same as equality, and the pursuit of social justice becomes a process of equalization (Smith, 1994:116). Noticeably, the egalitarian “simple equality” ignores any virtues or characteristics of each individual in society. In political egalitarianism, a society of equality shall be free from domination by an individual and the repression of others. However, an equal distribution of social power and resources to persons with unequal merits would also result in an unjust situation (Vlastos, 1997: 121). The individual’s social power is often reflected in the level of social goods acquired. Hence, in other contexts like finance, the definition of equality does not strictly follow the rule of egalitarianism, but also depends on the principles used to identify similarities (Weale, 1978). Equality in a society rests on minimizing disproportionate shares of power and resources, rather than absolute equality among all individuals (Walzer, 1983: xii). In other words, a society with a high degree of similarity reveals distributive justice, in terms of which the concept of “complex equality” is formulated, based on the three distributive principles of free exchange, desert and need.

In evaluating spatial distribution, equity is accepted as an approximate of equality (Coates, Johnston, & Knox, 1977: 20). Normally, equity (equality) is expressed as a sub-principles for judging the degree of justice (Elster, 1991: 275), and the allocation of goods ought to be equal for everyone. Such a measurement of justice tends to be practical and more related to daily life (McPherson, 1984: 62; Thompson: 1986: 137; Cohen, 1986; Smith, 1994: 49). Therefore, the

concept of equity is frequently applied in explaining the allocative process and distributive outcome of common goods or services. Nevertheless, it should be noted that equality is only a partial interpretation of justice in most situations.

**Justice.** Justice is established on a legitimate basis and seeks for authentic and lawful expectations. Decisions are made or actions are taken to reach such reasonable expectations. Any activity that deviates from the expected reasoning would be seen as unfair or injustice. The Oxford dictionary defines the noun “justice” as “fairness” or the “administration of the law or authority in maintaining this”. To justify means to treat fairly (Smith, 1994: 24).

The work of Rawls provides a systematic account of justice by elaborating its origins, principles and use in institutions and society. From the “Kantian interpretation”, justice was understood as “fairness” when conceiving theory in social processes (Rawls, 1999: 3). Justice is the first virtue from the perspective of social institution constructs (Rawls, 1999: 3). Justice is also based on the liberty provided by equal citizenship, rights and duties in institutions. According to these interpretations, the way of governing and allocating rights and duties will further determine the distribution of welfare and burdens in social life (Rawls, 1999: 47). Loss of freedom, unequal liberty regarding citizenship, or an uneven distribution of benefits are signs of an unjust society. Therefore, the rights and duties of each individual are the fundamental elements in “justice as fairness”. For each implicitly rational person, securing his/her own benefits from an equal position would be acceptable (Rawls, 1999: 102).

**Fairness.** Fairness comes from very different sources (Hay, 1995: 501). Procedural fairness addresses consistency without arbitrariness in a process (Hay, 1995: 501). Fairness has stronger links to moral and philosophical perspectives, but not to political arrangements or social institutions. Rawls introduced the term “fairness” in social construct and emphasized its relationship with individual initiative. His concept presumes that each individual will carry out his/her obligations if the defined rules of institutions are just and the individuals voluntarily accept the arrangement (Rawls, 1999: 96). Hence, fairness is more inclined to be a procedural notion of rights and obligations from a moral perspective, in maintaining the social arrangement.

### 2.1.2 Principles for judging EFJ (equity, fairness and justice)

The basic principles of EFJ (equity, fairness and justice) can be traced back to the concept of the free exchange of social goods (Walzer, 1983: 21-22). The ten principles were first derived from philosophical and ethics studies, and were illustrated in a study of transport policies (Hay, 1991: Tab.1, p. 454). These proposed principles include procedural fairness, expectations, formal equality, substantive equality, needs as demand, basic need, wider need, liberty rights, claim rights and desert (Hay, 1991: 454). Later, they were further developed into eight key concepts, namely, procedural fairness, justice, formal equality, substantive equality, equal choice, need, rights and desert (Hay, 1991: 454). Despite emerging from the disciplines of philosophy, politics and law (Hay, 1995: 501-502), concepts such as spatial equality, territorial justice and minimum standards have been applied in the context of geography (Hay, 1995: 503). This cross-discipline study sheds light on the proper use of these terminologies in geographic research. The brief summary below discusses the historical origins, definitions and main connotations of these principles in various contexts (e.g. philosophy, ethics and institutions). The concept of free exchange is discussed alongside the key concepts proposed in Hay’s work, and the concepts of justice and formal equality are also included in the discussion.

**Free exchange.** This principle first appears in the work of Walzer on the distribution of social goods (Walzer, 1983: 21). It is one of the three principles formulated in his work. Literally, free exchange is an open-ended rule without dominant goods and monopolies. The assumption of this principle is based on individuals’ willingness to accumulate and sacrifice social goods, and each transaction bears implicit social meanings (Walzer, 1983: 21-22). Free exchange is merely a concept that postulates the real force for the distribution of goods and is difficult to apply to the measurement of EFJ.

**Procedural fairness.** Procedural fairness is defined as the consistency, even-handedness and nonarbitrariness in procedures (Hay, 1991: Tab.1: 454). It implies that individuals are consistent over time and space without any bias. In other words, a procedure that handles people at this time and in this area would be the same tomorrow in other

geographic units (Hay, 1995: 501). Thus, without restricting a procedure or rule to a specific time in a named historical period, it preserves its generality over time and would be compatible with formal justice (Campbell, 1973: 114).

**Formal equality/formal justice.** Formal equality is defined as equal organization within a group (Hay, 1991: Tab.1: 454). This principle is also described as formal justice in the context of social institutions (Rawls, 1999: 47). This has been widely discussed in the arrangement of rights and duties in a political structure, which then determines the rational distribution of social goods. It emphasizes the appropriate application of rules to all involved persons. Formal injustice arises when individuals receive different treatment according to their position, instead of the appropriate rules (Campbell, 1973: 113).

Presumed justice would be fulfilled by legislation, law and morality which define the rational rules for any permissible and forbidden actions (Rawls, 1999: 49-51). Consequently, rational correct rules interpreted by authorities form an impartial and consistent political structure, in terms of which the laws or policies enacted are applied equally to the involved social groups. Formal justice reflects both the outcomes of rules as well as the distributive results of social benefits and burdens.

**Substantive equality.** Substantive equality refers to equality as an outcome (Hay, 1991: Tab.1: 454). This concept focuses on the objective outcome in distributing social goods, rather than the abstract concept of rights in a political structure. With the influence of John Rawls "A theory of justice", a long-term equality plays a predominant part in government policy. However, Flew questioned this; in social philosophy, defining equality in terms of distributing rules and entitling rights and burdens is hypothetical (Flew, 1987: 34-37). Flew insists that one's possessions are in reality the true outcome, influenced by implicit entitlements (Flew, 1987: 37). Clark holds the same notion that property rights are a real reflection of individual liberty (Clark, 1982: 120). The right to possess, use and dispose of property with personal expectations manifests how an individual's liberty is organized. Therefore, an equal distribution of substantive goods, wealth and income is a tangible outcome and a principle originating from the conceptions of justice.

**Need.** Need is a criterion for distributive processes. It partly means the allocation of necessities to the members included in Marx's maxim (Walzer, 1983: 25). This principle is a general distributive rule that proportionately allocates resources to people in accordance with the extent of their need (Walzer, 1983: 26). Critical discussions of "need" revolve around the distribution of rights, political power, honour and fame, scarce goods and so on (Walzer, 1983: 25). The concept "need" includes several types: basic needs, needs as demands and wider needs (Hay, 1991: Tab.1: 454), meaning the minimum requirements for existence, a willingness to pay based on a want, and wants respectively.

**Right.** Right is regarded as a form of relationship. Having a right means one ought to be treated in a certain way and is entitled to something by a legitimate system (Smith, 1994:35). It can also be institutionally defined as what can be done in relation to one another (Young, 1990: 25). In social and institutional contexts, right is characterized by an entitled moral force emanating from individuals' interests or expectations. This concept is related to the moral principle of equal entitlement, regardless of one's gender, race and religion. In the context of political philosophy, treating all individuals equally requires the protection of the rights and liberties they possess (Kymlicka, 1990: 50).

Noticeably, legal rights, also known as liberty-oriented rights, are more secure with the support of legislation (Smith, 1994: 38). Liberty rights refer to the civil and political rights or duties regarding the freedom of action and participation in institutional life (Smith, 1994: 38; Hay, 1991: Tab.1: 454). Since they aim at protecting individuals' freedoms and securities, liberty and property rights become a top priority. Security-oriented rights (or claim rights) refer to the economic and social entitlements of an individual and the protection of one's physical and material status (Smith, 1994: 38; Hay, 1991: Tab.1: 454). Declaration of rights is a means to specifically announce one's expectations. This action elucidates whether someone is entitled to certain rights before such rights can be claimed. Entitlement to rights can be regarded as a form of "membership" in a legal sense, since only "members" have the privilege of exercising the rights. It should be noted that, in a geographical sense, "membership" is commonly defined by people's location (Smith, 1994: 43).

**Expectations.** Expectations refer to an individual's reasonable or rational conceptions (Hay, 1991: Tab.1: 454). However, total satisfaction may be difficult to achieve, because of "social hijacking" by those with specific expectations (Daniels, 1985: 37). Taking moral conceptions as a reference, an individual can classify himself/herself as a "moderate", that is, one who adjusts his/her preferences in a reasonable way, or an "extravagant" one who pursues expensive luxury. Denying moderate claims to distributive justice, or establishing rules in favour of extravagant demands should be avoided in social arrangement (Daniels, 1985: 37). Consequently, it is assumed that everyone is a rational person who can recognize and adjust situations without betraying justice in society (Rawls, 1999: 81). Ideal justice may be attained when a social arrangement fulfils all the expectations of all individuals.

This principle was also included in the idea of the efficiency principle proposed by Rawls (1999: 59). This view stems from economics theory. An arrangement of rights and duties can be seen as an efficient structure only when the expectations of all members are met. Any changes to the rules may tend to meet the expectations of certain representatives and sacrifice those of others (Rawls, 1999: 61). However, achieving an efficient social structure that meets the expectations of individuals does not mean social justice is achieved. As an example, the ability of an individual and his/her contribution to the society are crucial elements of social justice, but are not considered in the context of expectations.

**Desert.** Desert refers to the distribution of social goods based on the merits and contributions of an individual (Hay, 1991: Tab.1: 454). Therefore, desert is built on the connection between particular goods and particular persons (Walzer, 1983: 24). It implicitly covers norms like rewards, merit, advantages, punishment and so on. This principle accepts a rational but disproportionate distribution of social goods and wealth, according to the varying contributions individuals make to society. However, the difficulty in quantifying individual merit and contribution poses hurdles for justifying the operative rules (Walzer, 1983: 25). It also suggests that the desert principle should not be applied to basic social resources or privately owned property.

## 2.2 Main theoretical schemas of justice

Some texts attempt to derive concepts from theoretical contexts. We deduce principal methods for judging justice and then present significant statements with their defined connotations.

### 2.2.1 Fundamental approaches to justice

It should be noted that any concepts or theory relating to justice are constructed on certain common principles. Hence, our review work has concluded some theoretical frameworks that all refer to certain common principles, such as "egalitarianism" for social justice (Smith, 1994: 54), "justice as fairness" (Rawls, 1971: 3), "libertarianism", and "utilitarianism".

**Egalitarianism.** "Equal treatment" is key to the concept of "egalitarianism". It refers to the way in which individuals' expectations are equally considered before the claims of various social groups. "Equal distribution" accounts for outcomes obtained by means of rules for rights, liberties and equal shares of material goods. The strong link between justice and equality has been manifest in many discourses on issues of political absolutism, economic exploitation, deprivation and disfranchisement by gender, race and income (Vlastos, 1997: 121). Further, some discourses on strict egalitarianism insist that access to resources or opportunities means that no one ought to have less than anyone else has. This simple interpretation has been questioned on the basis of moral disciplines and difficult practices. A biased interpretation merely emphasizes treating equals equally, regardless of people's specific abilities, contributions and efforts. The most recognized shortcoming is treating unequal things equally, which is also defined as an unjust action (Smith, 1994: 56).

Some other comprehensive works have adjusted the meaning of egalitarianism to justify a concept of justice away from strict egalitarianism. Vlastos (1997) has suggested five criteria with different treatment rules to define the application of egalitarianism precisely. Worth and need, the first two criteria, require equal treatment if we accept the equal worth and common humanity of all people. It should be noted that need also implies unequal treatment when unequal



demands are met, such as more health services for the sick and more police in high-crime areas. The other three criteria, merit, work and agreement, refer to distinct entitlements of people according to their specifics and abilities (Vlastos, 1997: 122).

**Utilitarianism.** The principle of utilitarianism stems from a moral context and relates closely to the welfare and economic system (Smith, 1853; Smith, 1994: 60). The application of utilitarianism aims to improving human welfare. Two aspects are emphasized in estimating this (Smith, 1853; Smith, 1994: 59): act utilitarianism (which links directly to human actions and consequences) and the rule of utilitarianism (which means the applied institutions for reconciling peoples' actions and welfare outcomes).

The employment of this broad concept together with the idea of justice is assumed to be universally acceptable, because it emphasizes the same share of welfare and equal consideration for everyone, as well as giving due consideration to each individual's satisfaction or preference. Thus, discussions have suggested the combining of concepts focusing on what people already have, the rights to hold and to increase at first, and then on individual needs (Smith, 1994: 65). Operating the two postulated principles in this way is supposed to maximize the effects of a utilitarian solution by allowing everyone to act as they please (which supports people to do as they wish) (Smith, 1994: 75).

**Libertarianism.** This approach prioritizes the value of individual liberty and freedom with minimum or even no constraint on one's wishes (Smith, 1994: 66). This notion was explicitly introduced in Young's work (1990) *Justice and the Politics of Difference*. Both restraint of rights (depriving people of their liberties) and deprivation of material outcomes has been elaborated as unjust. Moreover, Nozick (1974: 151) formulated justice on the principle that individuals' wishes to acquire and transfer possessions should be accepted when they successfully respond to justice, otherwise denied. Although important, defining principles on the basis of a subjective judgement is more Utopian, recognising a moral defence of private property, but has little practical relevance for public politics (Elster, 1991; Smith, 1994: 72).

**Contractarianism.** Contractarianism is a well-known method in academic studies for judging justice, and has greatly inspired the thinking behind theory formulation and estimating means in practice. This approach postulates a simplified social reality with the rules of contract (or agreement), from which the consequences of distribution and institutional arrangements derive (Smith, 1994: 73). The representative work is from Rawls (1997: 47), who structured a social justice schema by means of instituting priorities. His book, *A Theory of Justice*, is an influential piece of work that accounts for notions of contractarianism. As illustrated, the objective of general justice is to fairly distribute all social primary goods: liberty and opportunity, income and wealth and the bases of self-respect (Rawls, 1999: 300). So injustice has been simplified as inequalities that do not benefit all. In order to reach the goal, Rawls proposed an evaluation on both the subjective circumstances of people (e.g. needs, interests) who live within a defined territory and the objective circumstances of well-defined geographical territories. Accordingly, two dimensions have been offered. The first dimension of justice emphasizes the equal right of each person to the most extensive schema of basic liberties (e.g. right to vote and stand for office, freedom of speech and assembly, liberty of conscience and freedom of thought, freedom of the person from psychological oppression and physical dismemberment, the right to hold personal property). The second dimension stresses the reasonable reorganization of resources (e.g. income and wealth) while considering people's advantages and the access of all to common goods (Rawls, 1999: 53). To summarize, the principle of justice here focuses not only on equal rights in social regulation (maximum equal liberty principle) and equal access of all to responsibility (equal opportunity opportunity), but also includes unequal distributions in accordance with individuals' advantages (different principles). Rawls also proposed an order for thinking about these elements: liberty is prior to opportunity, and both come before the difference principles. In essence, what Rawls expects of justice is not to eliminate it altogether, but a process to lessening it.

Since it was first proposed in the 18th century, Many assessments have confirmed the significance of this deep and systematic elaboration for inspiring the development of both political and moral philosophy (Smith, 1994: 74). However, a number of critics have claimed that Rawls's practice is not fully contractarian because of a lack of bargaining strategy for working out conflicts. An advantage of contractarianism is the presumption of bargaining power that is driven by

people's own interests in the resolution of differences (Gauthier, 1986). Another weakness discussed is the insufficient understanding of inequality, maybe because insufficient attention has been paid to rewarding effort or to benefits. Hence, justice here is a complicated concept that consists of multiple elements of procedural fairness, formal justice, basic needs and desert (see Chapter 2.1.2). Justice is attained by addressing both distributive outcomes and the redistribution of common goods.

### 2.2.2 Theoretical reactions and empirical practices of concept “justice”

Commonly, studies structure frameworks of justice theory based on the recognition of the moral and psychological, and then seek possible ways to identify it in social and institutional procedures. Morally ideal justice suggested judging that prioritizes individual liberty, impartiality and equality; for instance, a historical understanding of the theory of justice, which once relied heavily on the idea of the “right” of human beings not to be robbed of life or liberty (Walzer, 1983: xv). This interpretation of morally based judgement is more prevalent in times of war. In practices in modern society, the concept is closely related to circumstances regarding individuals' property and life chances. While some research studies focus on how to establish normative constructs, others emphasize how to utilize them in policymaking or social development. For example, some ideas about EFJ (equity, fairness and justice) have been practically interpreted in policymaking processes. Transport policy at national level is predominantly designed on principles of formal equity and basic need, and even to some extent on the principle “minimum requirements” (Hay, 1991: 461; Pereira et al, 2017: 183), but policy documents at local level lack the mention of need (Hay, 1991: 462).

Interpretations of social justice theory may be concluded from various perspectives (Smith, 1994: 86-115). Widely noted are works from the perspective of Marxism, characterized by John Rawls (1999) and David Harvey (1992, 2008); as well as studies on communitarianism (Walzer, 1983; Young, 1990) and feminism which address the equal voice of females (Gilligan, 1982; Baier, 1987; Tronto, 1987: 656) and add their explanations to justice theory. The following discussion focuses on some significant conceptualizations related to justice.

#### 2.2.2.1 The right to the city

The key idea about the right to the city is the call for a radical restructuring of social, political and economic relations in the city and beyond (Lefebvre, 1991). The critical point here is to reframe the arena of decision-making away from capital and the state, towards the inhabitants instead. The notion of the right to the city gives conventional citizens a correct way of adding their voices to any decisions, rather than being partial participants or having a limited impact in decision-making contexts.

Instead of the conventional enfranchisement within the institution, the main purpose of the right to the city is to enfranchise people in all decisions that are linked to the urban space. That is to say, the idea claims that to urban inhabitants should be given a direct legitimate voice in any decisions associated with the production of urban space. The most important thing that needs to be defined is how the members should be empowered. In Lefebvre's concept, the right to the city is the right of urban inhabitants, “citadins” (urban dwellers), who live in the city space rather than the so-called national citizens (Purcell, 2002: 102). As indicated, the role of citadins (city-dwellers) in decision-making should be central. This suggests giving all inhabitants the right to full and complete involvement.<sup>1</sup> This definition rejects conventional liberal citizenship and opens up a central role for inhabitants. Despite not explicitly stated, the idea of “just” is implied in the progress of empowerment. If citizens' claims for beneficial rights are only accepted in conventional structures, it may lead to the exclusion of many people's voices and their rights may be sacrificed to satisfy the rights of the central group. Since all individuals are presumed to affect the urban space, discrepancies in empowering people against unequal treatment, such as the disenfranchisement of specific citizens, and differing empowerment according to national status, should be avoided.

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<sup>1</sup> These people's right entail two aspects: the right to participation and the right to appropriation (adoption). Participation refers to giving legitimate voices to people through institutions of the state, and appropriation means having rights in produced urban space and also rights to produce urban space (Purcell, 2002: 102).

Efforts to explain and operationalize have attempted to go further. It has been widely noted that the right to the city of Lefebvre provides a specific idea of space and socio-political processes. This idea has attracted considerable attention, being advocated in both theoretical reactions and empirical studies. However, his work is a more open-ended vision of urban politics that neither elaborates on detailed connotations nor conducts evaluations in depth (Purcell, 2002: 100). Thus, in imagining the devolving of rights to urban inhabitants more challenges have been raised regarding defining the extent of targeted groups in practice (Purcell, 2002: 101). The meaningful application of this postulation in urban space was first characterized in disciplinary contexts by Schmid, Stanek and Moravánszky (2014: 6). Subsequent works have achieved some results by way of actualizing and decontextualizing in own theoretical structures or empirical studies. Ensuing from the elaborations of Lefebvre, the following studies are mainly informed by two directions: a discussion of justice from the angle of liberty and right, and an exploration of (in)justice of the city from a socio-spatial perspective.

As to the first direction, some scholars have argued that disenfranchisement draws on notions of democracy. Inspired by Lefebvre, Young (1990) developed her schema of justice based on right and liberty and in particular his idea of subjective initiatives. As mentioned by Lefebvre (1996: 154), social classes that are capable of revolutionary initiative can realize urban problems and give responses. Similarly, Purcell (2002:103-105) proposed a scalar arrangement in politics to fulfil the right to the city. Inhabitants should be empowered on the basis of both right and the degree of involvement. Furthermore, the works of Harvey and Soja indicate the second direction remarkably. Their results highlight justice as containing ideas of political empowerment and socio-spatial practices. The theory of “the right to the city” enriches the formulation of Harvey. He called for the human right and liberty in forming urban resources rather than process of material facts (Harvey, 2008: 24). He insists that “the right to the city” should be promoted by progress in capital accumulation, circumvention and reinvestment in urbanization. Therefore, the idea depends more on collective power than on individual things.

### **2.2.2.2 The right to the city from a spatial perspective**

Essentially, discussing the right to the city involves considering a place-based social movement. The right to the city is the original formulation of Lefebvre for seeking spatial justice. Further, the growing concern towards this term relates to the increasing studies of geographic issues. Besides the social science statements about democracy and enfranchisement in the cities, the idea has developed a political economy perspective in geography, in which urban space is prominent (Purcell, 2002: 100). The insistence on the fundamental importance of the production of space for the survival of capitalism, is one of the strongest assertions ever made by prominent scholars.

Lefebvre defined the concept of urban space as three-dimensional: perceived space (spatial practice), conceived space (representations of space) and lived space (representational spaces). His triad model was inspired by the general spaces (organic space, perceptual space which stems from neurology and symbolic space) of Cassirer (1944: 1-39). Perceived space represents concrete space and physical practices in the everyday environment. Conceived space refers to the mental construction of space, which is the conceptualization by all people about what they perceive from physical space. It tends to be creative ideas about and representations of space. The representational space includes the connotation of the first two spaces, that is, to describe the lived circumstances, a comprehensive and integrated space. As stated, the “space of representation” is the process of signification, which is expressed in symbolism. The production of significance gives symbolic meaning to spaces and turns them into spaces of representation (Lefebvre, 1991: 52). Thus, it is not only a physical space, but also a reworking of objects according to the mental conception, ontological imagination and symbolic uses (Lefebvre, 1991: 38-39). However, assessments on the space categories, particularly the lived space, have been doubted for their overlap problems. Linking the sociological discussions and geographical imaginations would be successful when adequate tools (a set of concepts and techniques) are achieved that enable the welding of the two sides. Further, other interpretations of Lefebvre’s space have created new insights. For example, Foucault’s (1984, 1986) works adopted the first two of Lefebvre’s spaces. He agrees with Lefebvre by defining the perceived space by means of materialized attribution and defining the conceived space as an imaginative feature. The last space of opened up a new way of thinking spatially, described as “heterotopias” (Foucault, 1984: 3-9). It is a more comprehensive, combinatorial and critical idea that includes not only injustice and oppression but also considers potentially emancipatory and liberating opportunities.

Although Lefebvre's theory has provided new radical and profound thinking on capitalism and liberal-democratic citizenship, it still has distance to the systematic and complicated framework ones. For this reason, Lefebvre's concept has been assumed to be more radical, problematic and indeterminate than the current literature supposed (Purcell, 2002: 101-103). The proposal is an idea, a perspective, or a call for restructuring social, political and economic relations in urban space production, rather than a series of theoretical foundations or practical approaches. Lefebvre's notion of the essence of city points towards a possibility rather than an achieved reality (Schmid, 2012; Schmid, Stanek & Moravánszky, 2014).

During the period 1970–1990, several important contributions were made with respect to the geographical realm, including the time-space structure of Anthony Giddens (which actually derives from the work of the Swedish geographer Hägerstrand (1970)). Geographers did little to encourage the spread of the new critical perspective (Lefebvre's and Foucault's) until mid-1990s. By absorbing basic notions of Lefebvre on the essence of the city and the "space" and "urban", Schmid (2012) extended "the right to the city" to be recognized as "the right to (urban) space". The struggle for rights in urban movements requires knowing of what urban is and what the characteristics of urban crisis are. Thus, Schmid structured the schema on the basis of detailed phenomena in new urban processes (commodification, centralization and peripheralization) and the consequent transformation of city functions under the impact of globalization. The suggested form of the right to city today should be seen from three facets: the access to basic needs, the call for unity of the fragmented space, and the alliances that push the formation of new collective demands (Schmid, 2012: 58). Schmid's opinion provides an open mind for achieving the right to the city, as he supports the notion that urban is a constant reinvention that creates new possibilities.

### 2.2.2.3 Justice in social institutions

Being just is a matter that rests on concrete social and political practices. Explicit recognition of historical circumstances and contexts can provide a normative reflection on justice in social structures. By reviewing articles on justice in social institutions, several notions have been summarized as the main driving force behind the development of concepts.

**Dominance and oppression.** Dominance and oppression originate from social institutions. These two concepts were introduced into theory of justice by Young (1990) in her book *Justice and the Politics of Difference*. Compared to earlier abstract understandings, the practical implications of Young's work on institutional innovation has been widely confirmed.

She stated that social justice should build on differences without exclusion. This insists that people's differences in terms of heterogenic public statuses should be respected and acknowledged even though not completely understood (Young, 1990: 119). Her critique emanates from the experiences and concerns of the new social movements regarding decision making, cultural expression, division of labour, and issues of marginal and excluded groups in the US (such as women, African Americans, American Indians, gays and lesbians). Similarly, some theories build on justice structures by absorbing the opinion of the urban tolerance for difference. For example, inspired by Kifney (1989), Harvey suggested that social justice would be accepted while groups' differences were recognized and respected by the institutions without oppression (Harvey, 1992: 589). For pursuing a sound society based on a differentiated, culturally plural network of contemporary urban life, she advised a principle of group representation in democratic publics and group-differentiated policies. Young (1990) suggested that the concept of justice should be developed from a subjective perspective of domination and oppression. Since the two concepts are directly linked to issues related to the decision-making process and the division of labour and culture, rather than only to distribution (Young, 1990: 33), the importance of individuals or groups in social institutions can be actually recognized. Normative theory and public policy should undermine group-based oppression by affirming differences rather than suppressing them (Young, 1990: 183-191). Justification should focus on what people are doing and how their actions in turn affect institutional positions (Young, 1990: 25). The weights of different social groups regarding liberties, rights and opportunities are arranged by taking account of rational needs and merits. The theory highlights differences between social groups, which are supposed to highlight the benefited groups and the oppressed others; in another word, facts of injustice in society. In addition to emphasizing the critical role of social groups in social processes, Young doubts simple interpretations of distributive justice. The real meaning goes beyond the allocation of material goods to include the allocation of

institutional subjects such as power, right and opportunity (Young, 1990: 16-29). In this sense, her efforts not only add the concept of social groups to philosophical structured theories of justice, but also challenge the prevailing reduction of social justice to distributive justice regarding material goods.

**Democratization and disenfranchisement.** This notion is advocated by Marxist scholars by stressing the political system and empowered rights. Harvey's statements largely represents the way Marxist theory interprets the right to the city and how to achieve the right. He assumed that surplus distribution and urbanization are connected in the urbanization process through a series of circumstances such as urban demolition, urban reconstruction, urban centre fragmentation and urban space deprivation (Harvey, 2008). His opinion has triggered broad thinking about what the intrinsic element of the right to the city in current urbanization process is. No direct answer was given in the study but it did provide an approach to achieving rights in the city: "democratization" and "gaining greater control over the uses of the surplus".

Understandings of Marxism are subject to interpreting social problems based on polity and analysis rooted in and intrinsic to society. There is no doubt that surplus value and capitalism theory make it easier to identify the nature of urbanization. But a lack of concrete methods seems to be inevitable. How to obtain control over the surplus? Who directs the progress of struggling rights, and who holds the power to change the surplus distribution structure?

Essentially, the right to the city is a struggle process involving the goal of a better and just society rather than something programmatic. Compared to the broad understanding of Harvey, Lopes de Souza (2010) stresses the significance and value of various social movements on different scales. He criticized Harvey's macroscopic suggestions that the right to the city is to seize state power, but advocated pragmatism's practical movements to gain rights. In addition, Purcell has endeavoured to examine both the theoretical problems that Lefebvre's right to the city entail and what outcomes the theory would produce for democracy in the city. For instance, Purcell (2002, 2014) thought that neoliberal global restructuring decreases the enfranchisement of democratic citizens. With respect to the worries raised by the process of a globalized economy, governance has a tendency to be driven by capital rather than actors of local institutions. Local inhabitants would thus be excluded from the decisions that shape their cities. He has argued that the enfranchisement/empowerment processes are taking place along with the global restructuring: 1. rescaling – power is moving to the supra-nation level and devolving to local authorities; 2. policy reorientation – increasing emphasis by local government on shaping regional competition rather than the national economy or administration national-scale redistribution; 3. governance – functions outsourced to private companies or cooperatives create stronger competition in a global economy. In other words, local government is engaging in the formation of "quasi-public bodies" and "quangos" (quasi-autonomous non-governmental organizations) (Purcell, 2002: 00), and being more responsible for local governance in supply-side interventions, attracting investment, urban planning and infrastructure improvements etc. There is no absolute contradiction on interpretations of the right to the city between Marxists and those who support pragmatism and liberalism, but they are on different levels. Two proposals may be described as imaginative utopia and concrete utopia respectively.

**Local justice.** Local justice is regarded as the issue of allocating a certain amount of resources to a fixed number of receivers. In terms of the principles of the social justice construct, ideas of equality, need, merit and seniority are taken to formulate connotations of local justice (Elster, 1991: 273). Local justice schemas contain four identified rules to realize what a just allocation is. These are egalitarian (absolutely equality, lotteries and rotation), time-related principles (queuing, waiting lists and seniority), principles defined by status (age, gender, race, civil status, family status, residence, occupation etc.) and need-, efficiency- and contribution-oriented allocative principles (Elster, 1991: 275-279). The first rule means the equal division of goods and equal chances for everybody. The second rule is applied to manage the distribution of scarce goods in regard to time principles. First-come or first-served recipients have increased opportunities to obtain goods. The third rule defines the different access of people by age, gender, race and other such status. The last rule contains two principles: need-oriented allocation means to supply goods at low levels of welfare (Elster, 1991: 279). Efficiency- and contribution-based allocation means allocation with regard to advantages of individuals in terms of welfare or socially valued contributions (Elster, 1991: 281). This principle responds well to the idea of "desert" (see Chapter 2.1.2). As we can see, local justice focuses on procedural justice rather than outcomes.

#### 2.2.2.4 Spatiality of social justice

Nominative theories of social justice are on the rise with the realization that social arrangements are a human creation rather than a natural phenomenon (Barry, 1989: 3). The idea of “greed”, which is a concept to explain equal access to different benefits (Dorling, 2015: 1-6), in Dorling’s schema has shone light on the issue of spatiality of social justice (Davies, 2011: 380). This injustice is the consequence of five “social evils”: elitism, exclusion, prejudice, greed and despair.

The spatiality of social justice in the city can be recognized by the differences between groups in achieving need-satisfaction or well-being. In an actual situation, people in different territorially defined areas are presumed to experience various difficulties in accessing resources. The unequal distribution over geographic units can be seen in such entities as buildings, neighbourhoods and towns (Young, 1990: 245). Important works on spatial thinking are briefly introduced here. Walzer (1983) has identified equality as a society free from domination. Reaching the goal of equality can be realized by arranging social goods. The meaning of spatiality in Walzer’s examination is addressing distribution, that is, what and how much people have. Different goods are presumed to have implicit and specific social meanings attached, depending on their historical character. It is necessary to treat different social goods differently in accordance with their characteristics. This thinking is referred to as “complex equality” (Walzer, 1983: 18). Hence, independent rules are needed to identify particular patterns of inequality to ensure complex equality. Harvey’s explanation goes even further and indicates two important forms of social justice, namely, social contractarianism and utilitarianism (Harvey, 2009: 98). This city-embedded discussion insists social justice may not only be applied to resolve the division of benefits and burdens, but also to seek institutional arrangements that relate to production and distribution in society (Harvey, 2009: 97).

Harvey has traced the term “social justice” back to its original cultural, linguistic contexts. It denies egalitarianism because of its universal treatment of all needs, regardless of differences among individual. By combining modern, postmodern and rationality theories with social justice situations in different periods, he attempted to understand definitions and principles. In the modern era seven arguments on social justice have been proposed since around 1940 (Harvey, 1992: 592). These are: 1. a traffic efficiency argument which focuses on resolving traffic difficulties in flows of goods and people; 2. the consequences of economic growth, like the increasing investments and employment opportunities created by the development of the transport system; 3. aesthetic and heritage arguments which concern the possible negative effects of highway construction on urban attractions or historical sites; 4. social and moral order arguments that hold the idea that investment on highways should first suit the needs of car owners rather than focusing on housing and health care; 5. the environmentalists’ argument considers the negative effects of air and noise pollution resulting from the construction of highways; 6. distributive justice arguments focus on the benefits of residence for business and on those white-class in the loss of low-income earners’ interests; 7. neighbourhood and communitarian arguments consider that highway construction may damage close-knit but vulnerable communities. All of these arguments refer to spatiality issues and assist in the development of the concept of social justice in city areas. Subsequently, Harvey has endeavoured to establish a normative theory of spatial allocation based on principles of social justice. Several opinions (e.g. inherent equality, supply and demands, need, inherited rights, merit, contributions, actual productive contributions, efforts and sacrifices) have been concluded to understand what disciplines are involved in socially just distribution (Harvey, 2009: 100). Except for the first point, inherent equality, the rest of the seven principles are all directed at unequal or different claims among individuals. It is very clear that social justice here is not equal to simple egalitarianism.

Furthermore, outstanding research by Rawls (1971), Rescher (1966) and Runciman (1966) has added weight to arguments on equality at a spatial level. The principles of social justice that apply to geographical situations can be summarized in three points (Runciman, 1966; Davies, 1968). 1. Need: the spatial organization should meet the needs of the population. This principle requires that a socially just method should be established to measure needs. 2. Contribution to the common good: this refers to a social organization to provide extra benefits to geographical territories. 3. Merit, which means a deviation from territorial investment to overcome specific environment difficulties.

The main importance of the above works is their contribution to framing a theoretical structure. The following arguments will introduce the perspectives for viewing the spatiality of social justice. We divide the past debates into three streams: the first one focuses on spatial justice and emphasizes a more balanced dialectic between social and spatial causality. The other two begin with the notion of territorial justice and split off in different directions: the second one is based on geographical studies of inequality and social welfare, and the last one takes more radical path through Marxist geography to critical studies of the urbanization of injustice.

**Socio-spatial dialectic.** Instead of overstatements on the autonomous determinant role of the spatial structural forces of Lefebvre and the unnecessary boundaries that conceptualized space and spatial relations, a dialectical definition of production and relations of both a social and a spatial nature is necessary (Soja, 1980: 208). Support for the socio-spatial perspective in empirical and theoretical studies is represented by the following works:

Soja (1995: 20) represents the socio-spatial dialectic perspective, particularly in studying the new urban process, in which new urban patterns are shaping and overlaying the old urban fabric. In the book *Postmetropolis*, Soja (1995: 21-23) argues for six dimensions of urbanization in the with view of both the above (macro-urban discourses about upper systems) and the below (micro-urban debates about everyday life) with the aim of giving an overall voice to the causes of urban restructuring, the empirical consequences of social and spatial aspects, and societal responses (e.g. fortress city, new urban imagination, simulacrum/similarity). He explicitly demonstrates six activities using concrete examples: Flexcity, Cosmopolis, Exopolis, Metropolarities, Carcereal Archipelagos (fortified city with prisons and surveillance), and Simcities. In particular, the fourth discourse explores the results of increasing social inequalities and widening gaps, as well as polarization and stratification based on class, race or capital articulation. These issues were understood in area of social disorganization and moral order by Jackson (1984), whose discussion emphasized the importance of ethnological approaches that focus on spatiality and sociology.

Kipfer and Kanishka (2014) have indicated the spatial relations between and within social classes by reviewing how welfare goods are organized by institutional power. Drawing on issues of social housing and social mixing, the study gives details on public housing projects in Toronto and Paris from colonial and neo-colonial perspectives. Therefore, their discussion is a seeking for the right to the city specifically regarding territorialized social policy (spatial forms of political domination) (Kipfer & Kanishka, 2014: 103). In addition, another social phenomenon, “colonization”, has been induced with a spatial conception. Commonly, “colonization” is interpreted as an inactive effect that occurs by forceful means against reluctant reverse of acceptor. This concept is also understood as a “development” that happens between regions and cities (Shukaitis & Graeber, 2007).

Samara, He and Chen (2013) have examined injustice and inequality in the city from a socio-spatial dialectic via the issues of land displacement, demolition and urban space reconfiguration in the Global South with particular political regimes and active actors. Spatial demolition may benefit some groups at the cost of others' spaces who have constrained rights and a lack of voice in politics. These critics have impelled thinking over what is the real goal and effective criteria for achieving the right to the city.

To sum up, the key principle of a socio-spatial dialectic schema explicitly demonstrates how relations of social production and social formulation affect the position of all agents. It emphasizes a socially produced space and remains a consideration on both social systems and spatial structure.

**Geographic justice of social facts.** This perspective focuses on the social attributes of benefits and burdens. When considering the way in which social facts should be allocated within certain spaces, it is important to consider subjective needs. Davies (1968) presented this new idea as a normative goal for local and regional planners in arranging public services and investments for different territorial units. He suggested that government actions should not only depend on population size but also consider the actual social needs. Several research studies have aimed to fulfil the need to operationalize territorial justice. Since formulating an indicator system is ambiguous, measuring satisfaction still provides notable information on needs in a certain space area (Davies, 1970: 215).

**Marxist geographical perspectives on injustice in the urbanization process.** The emergence of this study group is a result of seeking resolutions for failed institutional structures. Dahl and Lindblom (2007) have examined experiences during the Great Depression and World War II. They suggest that some kind of middle ground should be found between the extremes of a pure, unfettered market economy and the highly centralized economy of the communist era. In 1960, the relative analyses on social rationality and conceptions of social justice were regarded as “leftist” policy tools. Social rationality was postulated with close connection with capitalist economic system (Harvey, 1992: 593). During the period 1970–1990, market rationality began to play a role in social justice. In the United States and Great Britain, the market was considered in the neoclassical economic tradition as the best way to achieve just and rational forms of social organization. However, rational government interventions are still indispensable because of inherent flaws in the market which resulted in breakdowns (Harvey, 1992: 594), as was postulated earlier by the many works of John Maynard Keynes (1926; 1932).

Marxists emphasise both the balanced socio-spatial dialectic and the value of the right of the city of Lefebvre. The emergence of Marxist discussions of spaces were characterized by a resurgence and recasting of Lefebvre’s assertion of the right to the city. Contemporary revivals on the right to the city have made some references to this idea. However, the assertive spatial approaches of Lefebvre and the notion of consequential geographies have been mostly ignored. His radical political objectives have been reduced to softer liberal egalitarianism or normative platitudes (Soja, 2010a: 107). Subsequently, many studies have attributed the spatial inequalities to political, social and economic structural flaws (Fuchs & Demko, 1979: 304). The socialist, radical Marxist form was postulated as remedy to eliminate disparities in geographic territory. A number of differences in territories have been discussed, such as different productivity, social well-being and wage levels of individuals, varying provisions of facilities and disproportionate investments in cities, the existence of regional inequalities (urban–rural disparity, inter- and intra-urban disparities, inter- and intra-rural disparities). And from the perspectives of Marxist geographers, testing the spatiality of justice in multiple disciplines focuses on “arbitrarily differentiated criteria” (Fuchs & Demko, 1979: 314). So, simplifying the spatiality of justice to equality is rejected by this viewpoint.

Although generated from the opinion of “the right to the city”, Harvey’s schema is a spatially fixed justice; it attempts to grapple with the built environment of capitalism. Harvey addresses the underlying structures in a city and the shaping processes of urban life and urban geographies in capitalist societies. On the one hand, the urban environment may produce unjust geographies, while on the other hand it also sustains and stimulates its own capitalist development. Thus, Harvey rigorously analysed the way social and economic inequalities/injustices are generated in the city environment. In analysing from this angle, we may obtain more results than are achieved from discussions on the injustices of urban settings functioning. In addition to quoting “five faces” of oppression of Young (1990: 39-63) (i.e. exploitation in the workplace and living place, marginalization of minority groups, powerlessness, cultural imperialism and violence), Harvey has pointed out a sixth point: the ecological consequences of all social projects of planning and policy practices (Harvey, 1992: 600). In many ways, he endeavoured to analyse the causes of social and spatial territorial inequality. As mentioned, the differences between needs and actual allocations draw attention to territorial injustice in an existing system. In the evaluation of justice, Harvey specifically calls for socially just methods to determine needs.

On the basis of these perspectives, further exploration on both theoretical and empirical studies has been summarized. With respect to conceptual works, Mitchell (2003) has advanced an understanding of the urbanization of injustice. His efforts have appropriated the limitations of the schemas of Harvey and Lefebvre. And engagement with Neil Brenner, Mustafa Dikeç, and Mark Hamilton Purcell especially has indicated their opinions. Dikeç (2001) has made efforts to theorize the concept of spatial justice. In contrast to an emphasis on the generation and maintaining of injustice across space, he supposed that the key to examining the spatiality of injustice is to know how injustice embeds in space. Brenner (2009), whose work refers to the state and state restructuring, has led studies on a broad discussion of spatial theory. Purcell (2008) reintroduced the concept of “the right to the city” in current discussions on the search for spatial justice.



Besides the theoretical discussions, some studies have utilized the theory to explore topics pertaining to the role of the city in social movements and global linkages. Social movements calling for the right to the city are generally locally based or locally developed, but they do not end at the city level. In this sense, the city is not only an active entity in social movements; rather it is a way for creating global–national–local connections. Coates, Johnston, and Knox (1977: 23-52) have indicated the patterns of inequality in space from three levels: international, intra-national and intra-urban. Globalization stimulates capital flows and further eliminates the power of local authorities particularly in the outsourcing process. To respond to the uncontrolled capital and economic risks, a supra-city entity is formed. This stimulates cooperation and ensures stable development by sharing risks. This trend also results in the rethinking of definitions of “city” and “scale of city”. In terms of globalization, regional cooperation is quickly shaped (e.g. the regional economic zones of “Asia-pacific economic circle”, “North America economic circle” and metropolitan areas), which has resulted in new thinking: can the right to the city be widened to include the right to the region? How should the boundary of city be defined in terms of the right to the city? By recognizing the function of a city, some efforts have explored tactics to enable the local state to deal with social movements (Uitermark, Nicholls & Loopmans, 2012; Margit, 2012). Ellis and Kessel (2009) have used the case of Africa, by analysing its international capital flows, morals and ideologies in social movements to identify the roles of city at different levels. Moreover, social justice has been adopted in advocating public interventions in spatial issues related to the management of coastal erosion (Cooper & McKenna, 2008). All of these discourses open a broader view for perceiving the right to the city. A discussion of social movements in the city not only makes sense in terms of the city but also in terms of transnational linkages.

To sum up, the feature of spatiality cannot be overlooked in social justice no matter whether addressed or not. In line with the growing recognition of geographical features of justice and the advantages of their applicability to empirical studies, viewing justice from a spatial perspective is increasingly attractive. However, this attention is not enough to express the spatiality of justice because of the remaining emphasis on the roles played by institutional structure and social relations. The limits of regarding spatiality as a partial outcome that is produced by systematic works has stimulated the generation of spatial justice theory.

### 2.3 Spatial justice theory

Contemporary studies on geographies of justice are a “seeing and seeking justice” in space, which highlights the outcomes and processes of social actions in particular and actual areas. As we know, discussions of political justice and social justice are widely used in normative paradigms concerning what political procedure, process and participation should be like (Fincher & Iveson, 2012: 231). The concept of spatial justice relates to terms like democracy, rights and citizenship to reflect economic and social inequality. In other words, geographic contexts of justice emphasize what the thing actually is, then explain the situation as good or bad, right or wrong (Smith, 1994: 3). Explicit endeavours of geographic studies on social justice date back to the late 1960s (Smith, 1994: 4). However, the discussions started much earlier than this, although most of them went unnoticed. The notion of spatial justice was developed mainly in British Geography but was not theorized or elaborated much further. The city crises in 1960 encouraged the evolution of concepts of spatial justice. The heterodox Marxist philosopher, Henri Lefebvre, originally conceived the notion of the right to the city. The purposes of the right to the city mostly pertains to obtaining power over processes, as well as the pursuit of a fair and equitable distribution of urban resources.

The specific use of spatial justice in academia started from the 1970s. The adoption of quantitative approaches in spatial science (e.g. location analysis, model building and so on) prompted investigations of radical geography from the early 1970s. Harvey’s “Social Justice and the City” in 1973 chose the term territorial justice to describe the spatiality of justice (Harvey, 2009). However, Harvey and some Marxist geographers rarely used the term “spatial justice”, and spoke more tangentially about the urbanization of injustice (Soja, 2010a: 82), such as the first major text of Coates, Johnston and Knox (1977: 5-21), and works of Smith (1976), which deal with apartheid South Africa. In total, only a few scholarly works used the term “spatial justice” in the 20th century. The first use appeared in a study by political geographer John O’Laughlin in 1973. From the 1980s, the term started to emerge in the works of geographers and planners in Los Angeles from a geographical perspective (Soja, 2009: 4). One is a short article, which shows the curiosity and concern of the author over the term “spatial justice” (Pirie, 1983). Another one is a small pamphlet written

by Steven Flusty (1994: 13). He explored the phenomenon, what he called "erosion of spatial justice", from the architectural perspective influenced by Mike Davis's work *City of Quartz* (1992). The value of Los Angeles efforts on spatial justice have been greatly confirmed by Soja (2010a: 111-178), particularly the proposition to recognize the spatial structure of productions from a spatial angle and then to devise political strategies. In the period from 1970 to 1990, much discussion in geography about justice and urban spatial structure is moral based, such as the interpretations of "moral distance" (Jackson & Smith, 1984: 66) and "moral climate" by Jackson and Smith (1984: 173-174).

Subsequently, attention turned towards disparities between spatial units. By end of 1980s, an emphasis on human diversity and differences became the main issue of spatial injustice (Smith, 1994: 5-7). This was a result of rising issues concerning marginalized groups, geographic patterns of social well-being, and quality of life in urban or regional areas. It was also a consequence of the widening gap between the rich and the poor, which was driven by economic change. However, the explicit use of the spatiality of justice and injustice in geographical studies is inadequate from local to global, or from city to regional scales (Soja, 2009: 1). Because of the deficiency of attention being paid to spatiality, Soja (2009) advocates for explanations from geographic perspectives as they are real practices. These efforts were confirmed as efficient acts for achieving improved justice or democracy.

### 2.3.1 Interpretation of key principles of justice in geographical studies

Many constraints may be experienced when transferring social justice from theoretical principles to practical approaches. A variety of disciplines pertaining to the justice structure originate from abstractive contexts of morality and philosophy. These principles were further applied in theoretical socioeconomics and then used in actual practices for socio-spatial development (Smith, 1994: 116). It should be noted that the proposed principles cannot all be successfully applied in geographical studies. Considerable uneasiness still remains when understanding "justice of space" across society and space. Both distinct criteria and deviation between research areas may add to the difficulties when estimating justice in geographical areas.

The mostly transformed principles in geographical studies are formal equality, subjective equality, needs and rights. 1) Formal equality in geographic study relates to the issue of discrimination between people situated in different geographic units. The behaviour of allocating weights according to locations is thought to be a cause of exclusion in some areas. Arranging social goods in this way may be partly beneficial to specific areas, but then achieving different benefits implies that equality is denied (Hay, 1995: 504). 2) Subjective equality in geography refers to a proportional distribution of material goods to ensure equal access by people in different locations. This concept has been widely perceived and directly shapes the significant opinion of the territorial distribution of justice. Currently, analyses influenced by the territorial distribution of justice tend to stress the entitled access to resources of territorially defined groups. 3) Needs have been widely adopted as a critical criterion in the assessment of justice that is associated with distribution. Davies has proposed that "need" should be determined according to the problems we are looking for (Davies, 1968: 16). For instance, the best way to define consumers' needs should be in line with the conventional supply and demand analyses. The explanation of housing needs is suggested to depend on statistical analysis and medical care needs by means of expert opinion. Accordingly, Harvey has defined nine social goods (i.e. food, housing, medical care, education, social and environmental service, consumer goods, recreational opportunities, neighbourhood amenities, and transport facilities) that should be distributed in line with the principle of "need". Need in society has been categorized into four types: market demand, latent demand, potential demand and consolation (Harvey, 2009: 102-104). 4) Rights in spatial justice can be defined as people in a study area having a right. However, this interpretation seems inexplicit. Nevertheless, though seldom used, the principles of contribution to the common good and merit are also accepted and transformed into fundamental geographic principles to improve allocative patterns over territory.

Despite studies having explained how formal equality, substantive equality and need in spatial relevant research should be used (Hay, 1995: 503), problems still emerge. Geographical evaluations greatly depend on the spatial proportionality of material resources, and the justice process has difficulty finding proper approaches to geographic thinking. It is widely recognized that spatial justice is a concept of both outcome and process and both aspects are important in

judging a justice. Therefore, more exploration is still needed to improve the operationalization of theory. The following part focuses on proposed ideas of spatial justice. We give an overview of how geographic researchers understand justice in space.

### **2.3.2 Established frameworks of spatial justice**

The formulation of spatial justice have several origins. Some studies of spatial justice started on philosophical, moral or legalistic grounds. These frameworks may be closely related to issues of liberty, rights, law and institutions. Some discussions have established a territorially focused schema from a geographical perspective. Either little attention was paid to spatiality in early the literature explanations, or ignorance of theoretical explanation in geographical evaluations was shorthand for the term “spatial justice”. Nevertheless, some combinative discourses address both sides of theory-based democracy and practice-based justice. These investigations have conceptualized “spatial justice” as principles/dimensions, criteria and approaches in terms of specific theory contexts or targeted empirical issues. In this section, our study reviews the remarkable structures which were established in various situations.

#### **2.3.2.1 Sketching spatial justice in structural dominance and personal liberty**

Spatial justice in the political system concentrates on civil rights and the actions of inhabitants. The main purpose is to decide the best way for equitable access to urban resources for all people who are qualified to receive them. As a result, defining individuals' rights and responsibilities while considering their places has become the focus of recent political frameworks for achieving spatial justice. Many proposals have assumed that the political process plays a predominant role of in reconciling unjust outcomes in the city area. So the articulated institutions or policies by authorial organizations may support society relations, facilitating an engagement of space in the actual urban system (Harloe: 2001: 890; Stanley, 2009).

Because spatial justice is the product of the law's spatial turn, it claims that nowhere else but in the area of law can spatial justice remain (Philippopoulos-Mihalopoulos, 2014: 174-175). Philippopoulos-Mihalopoulos (2010: 201) endeavoured to redefine the connection between and the conceptual ground of law and space. The ideal spatial justice in law system would be the withdrawing geographical actions for legal claims, argumentations or decisions before declaring demands of justice. His work emphasized spatial justice as manifold and all-embracing, which means that connotations of spatial justice should be put forth in specific contexts like post-structural, feminist, post-ecological discourse. This idea not only offers a chance to understand the concept adequately, but also to make sense of its applicability (Philippopoulos-Mihalopoulos, 2010: 202).

The combinative explorations of structural organization and spatiality started with a stress on the importance of spatial. It has been recognized that political organizations and the normal workings (everyday activities) of urban functioning are the sources of spatial injustice (Soja, 2009: 3). An important use of spatial justice is to manage the meaning of space in seeking political rationality in the city. Key to the practice of spatial justice is two essential goals: an explicit recognition of spatial results under the management techniques, and having efficient spatial actions to reach rational decision-making on structural institutions (Brawley, 2009: 15).

Moreover, politically based discussion also attracts attention to issues of social inclusion and social cohesion. In judging spatial justice these matters should be regarded seriously. Although explorations from this perspective do not focus on spatial outcomes but on the social phenomena, they cannot be ignored because these phenomena contain spatial attributes and they may play a role in shaping spatial patterns. Harloe (2001: 896) indicates the effects of competitiveness, social cohesion/exclusion and spatial capital on distributive justice, including marginalization, discrimination, residential segregation and social exclusion of individuals or groups in specific locations. Moreover, some explorations of environmental justice have been engaged in the political arrangement calling for democratic governance. In terms of these ideas, which stress “equal choice”, equality will be achieved when all members of society have the same choices regardless of where they live (Le Grand, 1991: 87). Institutional empowerment is a more important issue than merely pursuing a just distribution.

### 2.3.2.2 Forming spatial justice in spatial-related theories

The development of the nominative concept of “spatial justice” in geographical studies is found mainly in the “the right to the city” and “social justice”. This part has summarized the three theoretical structures of Young, Marcuse and Soja. These works all consist of comprehensive principles, which are not only spatial but also social and political. The definitions, principles and investigations of these three notable ideas will be shown in sequence.

Young (1990) suggested a shift in emphasis from distributive justice (outcome) to structural justice (process). Young's spatial justice of a multifaceted concept which consists of five forms: exploitation, marginalization, powerlessness, cultural imperialism and violence. Exploitation refers to an unjust distribution of economic wealth owing to constrained movements between classes. Marginalization refers to the fact that some groups may have limited participation and restrained access to resources. Powerlessness is a politically based notion that focuses on the decreased political power, participation, representation and self-expression of some groups. Cultural imperialism is also described as a colonial cultural domination. It means that one culture loses its own characteristics in interaction with another culture. Violence refers to a tolerance of dangers in daily life (Young, 1990: 39-63). To sum up, Young's spatial justice contains notions of territorial justice, environmental justice and the right to the city (Soja, 2010a: 79).

Marcuse (2009a: 187, 195) states the causes of spatial (in)justice, with the right to the city as the main cause and spatiality as the secondary cause. This structure assumes that the unjust phenomenon of geographic area lies originally in the social, political and economic arenas. Spatial justice is a derivative of social justice (Marcuse, 2009b: 4), while spatial attribute is a subordinate element of social attribute. Thus, remedies related to spatial actions only would be insufficient for eliminating injustice in the city. Dikeç (2009: 2) holds a similar opinion, stating that space is an effective tool in social control, mastery and dominance. His structures contain notions of the spatial dialectics of injustice, the right to the city and the right to difference (Dikeç, 2001: 1794). Subsequently, a measurement for spatial justice was formed: the “ideal of egalitarian” (equality-freedom).

For the purpose of promoting democratic politics and social activities, Soja (2010a, 2010b, 2010c) has established a structure with reference to the notable concepts of “the right to the city” and “social justice”. The schema is not only a theoretical formulation but also contains operational measurement. It confirms that any movements will have spatiality and spatial effects, but neither guarantee success or an easy resolution (Iveson, 2011: 257). Common forms of spatial injustice are characterized by locational discrimination, the political organization of space and the distributive outcomes of urbanization (Soja, 2010a). In contrast to Marcuse, who places social justice in a superior position, Soja insists that spatial force has the same importance as social, political and economic forces (Soja, 2009; Iveson, 2011: 252-255). Space is regarded as both a product and a producer of social relations. Justice in spatiality is both stable and dynamic, outcomes and process. In this sense, the evaluation of spatial justice involves two tasks: portraying outcomes of (in)justice in spatiality; and seeking spatial causality of (in)justice. The outcomes are easy to find, but depicting the process of socially produced spaces is more difficult.

### 2.3.2.3 Structuring criteria in spatial practices

For better applicability, some studies have attempted to enrich connotations of spatial justice in specific practices. The central role of democratic deliberation in historical contexts has failed to indicate the equality of primary goods or political equality in practice. The first pragmatic effort was the territorial justice that was coined by Bleddyn Davies (1968). Another notable discourse in the early years was proposed by Pirie (1983). He claimed that exploring spatial justice makes sense only in the successful use of principles. We should stay away from refining logical thinking in political theories. For researchers who focus on applicability, the reason for conceptualizing spatial justice is for making judgements in a spatial settings. The difficult or even unavailable assessments of processes with aspatial attributes would be not the aim (Pirie, 1983: 470). Territory-based distributions of choices, wealth and opportunities are important ways for fulfilling spatial justice (Pirie, 1983).

Following the earlier works, Fainstein (2009:2) formulated criteria for spatial justice in empirical planning at urban level. He suggested judgement should be developed paying attention to both actual economic inequality (outcomes) and the potential effects of structural inequality (process). Largely influenced by justice opinion of John Rawls (1971), Fainstein's discourses on a “just city” not only test the distribution of opportunities and power, but also examine the

distribution of property. The three components for shaping a just city are material equality, diversity and democracy (Fainstein, 2009: 15-16). Examinations depend on three points that have been applied in urban arrangement in New York, London and Amsterdam. New York has planned more investments in projects of affordable housing for improving equality. Additional actions include providing parks and waterfront access in poor neighbourhoods. For fulfilling democracy, local government has tried to promote autonomy by improving citizens' participation. In a just city, diversity is demonstrated in the way in which urban functioning and development are combined. London has put more weight on equality, mainly by adding services in disadvantaged areas and diverting development from central areas. In Amsterdam, "diversity" has been strongly committed to. The government has designed the reconstruction of areas and neighbourhoods in terms of ethnic diversity and a mixed economic environment (Fainstein, 2009: 9-14).

An expanded use of "spatial justice" is represented in the study of "urban common" by Chatterton (2010: 627). His discourse attempted to fulfil spatial justice in a form of "urban common". He explains the common as a comprehensive form which consists of shared values or interests. Alternative policies support the operation of common wealth. The proposed way of reaching an ideal urban common is to develop the vital social resources, land and life-worlds for disadvantaged groups (Chatterton, 2010: 626). However, this principle is hardly seen as a clear-cut one that can be applied in evaluation.

#### **2.3.2.4 Sub conclusion**

These frameworks of spatial justice that have been derived in various contexts, demonstrate the different focuses in defining concepts and principles. Firstly, political theorists hold the view that institutions play a predominant role and spatial justice should be a subsequent outcome or phenomenon. That is to say, spatial justice is an evidence of justice in the policy system. Any problems shown in space can be linked to political actions (e.g. enacting policies, amending laws, empowering political agencies). Secondly, studies of geographical thinking are developing in two directions. The first one focuses on the distribution of material goods or social resources to people in specific locations. This is a practical opinion. However, these engagements have been criticized for their partial, superficial but overwhelming emphasis on outcomes. Studies in the second direction hold that opinion that spatial justice is also linked to the democracy and rights that are produced by political organizations. In spite of the centralized principle of distribution as the first concern, the frameworks add original theoretical notions to empirical studies.

#### **2.3.3 Territorial distribution justice**

This concept emphasizes the actual sense when proposed in early years. (Davies, 1968; Walzer, 1983). Owing to the advantage of responding to the nature of space in visible, a number of geographical studies have used the territorial distribution of justice to assess spatial justice. Even discourses have suggested leaving out the legalistic part, and assert briefly that the focus of spatial justice should be distributive justice (Pirie, 1983: 465). Surely, these narrow explanations of spatial justice should be doubted. But they have highlighted the main body of what geography should do in the justice issue. Taking these opinions as reference, our study regards the territorial distribution of justice as the first dimension for measuring spatial justice.

##### **2.3.3.1 Early studies on distributive justice**

Just distribution is also understood as "geometrical equality". Smith (1994: 116) suggests that justice should be explained in terms of the idea of "equalization" in the real world. With the emphasis on distribution, the notion concerns issues related to the different treatment of rights, burdens in social institutions and the possession of substantive objects. This idea is based on the measurement of basic needs (minimum standard of living) (Davies, 1968:16), and the outcome of just distribution should be proportional equality (Smith, 1994: 24). In other words, the essential requirement of territorial justice is proportional service provision to service needs (Boyne, 1991: 263). Due to its emphasis on fair and equitable distribution in space, researchers commonly regard the definition in the broad sense of spatial justice (Soja, 2009a: 2). Lösch (1954: 520) inferred some forms for organizing spatial equilibrium. He concluded that hierarchical consequences may be inevitable. Every good has a specific productive function or consumptive function and equilibrium may remove these differences.

However, practices of territorial justice normally narrow down to identifying outcomes like material belongings and services (Young, 1990: 8). These studies assume that these objects are the result of social arrangements with moral or philosophical meanings. Against these narrow explanations, Campbell (1988) suggested that justice should be evaluated with unfettered egalitarianism. Distributive justice is wide ranging in that all socially desirable objectives (things, experiences, power, opportunity etc.) may be included (Campbell, 1988). In other words, the term embraces both the fairness of social goods and the equity of physical distribution (Smith, 1994: 26). Similarly, Harvey insists that the real meaning of just distribution for territory is not only meeting people's needs in territorial units, but also maximizing the interregional multiplier effects of allocation, and overcoming special difficulties by distributing extra resources (Harvey, 2009: 99). Finally, just distribution should be able to adjust institutional and social mechanisms of production and distribution (Harvey, 2009: 109).

Smith (1994: 148) has suggested understanding territory-based distribution in terms of the local, region and international levels. At local level, this interpretation means the territorial distribution of justice. This phenomenon refers to the different level of access experienced by territorially defined groups to common goods and services. This fact is associated with unequal distribution. Thus, Harvey considered using need, contribution to the common good and merit as criteria for distribution (Harvey, 2009: 101-106). An ideal distribution across territories should fulfil such requirements: meeting the basic needs of people in each territorial unit, considering the spread effects of allocation to one territorial unit on the circumstances in other units, and the allocation of extra resources in special situations like earthquakes or floods (Harvey, 2009: 96-116).

### 2.3.3.2 Approaches for examining distributive justice

Detailed assessments of distribution have several branches in terms of targeted goods, people and social contexts. The targeted items in distributive justice are social goods (e.g. social and environmental services, consumer goods, recreational opportunities, neighbourhood amenities) that are closely related to people's daily lives. Common material goods (e.g. food, housing, medical care, educations, and transport services), environmental goods (e.g. toxic waste and pollutions) (Williams, 2013: 3, Soja, 2010a: 167; Bowen, 2002; Stanley, 2009; Zilney et al, 2006; Tarrant & Cordell, 1999) and economic opportunities (e.g. jobs and incomes) are also included. Fick and Winnie (1974) categorized service provision into three: inputs, outputs and impact. Among them, outputs has been defined as the most appropriate for evaluating territorial justice.

As indicated, the just allocation of these things over spatial areas should be in line with equal access and individuals' needs. Prior to an overall application of distributive justice in geographical study, we have to be clear about the methods for defining accessibility and the needs of individuals to different things. Physically accessibility has been widely probed by geographic academics, from which we can obtain abundant experiences with measurement. With accurate geographical means, studies have attempted to evaluate justice levels by testing the spatial attributes (e.g. distance, scale, service area, spatial interrelation and so on) of services and individuals in specific positions. Just access does not eliminate differences between people to obtain exactly the same situation of everyone, but minimizes inequality of opportunities after meeting primarily guaranteed minimum demands (Rawls, 1999: 43-44). Then, individuals' needs are more like an imaginative opinion of theory. Indeed, it has some way to go to being evaluated in practice. The first challenge involves defining the threshold of basic needs. Needs are easy to measure in terms of breadth (the number of people and the amount of needs), but not of depth. The second challenge is multidimensional (Pereira et al, 2017: 182-183). Principally, needs include normative needs, expressed needs, felt needs and some combination of these (Boyne & Powell, 1991: 265). As these are intricately linked to characteristics like age, education, income and so on, this multidimensional nature causes difficulties in defining the weight of each dimension. This nature may lead to difficulty in creating a complete measurement.

Specifically with regard to difficulties, one extreme measurement defines the existence of territorial justice when a strongly positive correlation can be confirmed between service provision and the indices that reflect the needs of individuals (Davies, 1968: 16). However, the theoretical assumption of justice refers to a positive association between two elements. This association does not mean a binary correlation, nor a significant coefficient (Boyne & Powell, 1991: 275). Thus, this method has deviated from the original criterion. Moreover, even if strongly positive correlations can be

proved by statistical data, this is still inadequate as evidence of territorial justice. As the indices for measuring needs cannot be depicted overall, measures of needs in healthcare and in education in particular are required (Boyne & Powell, 1991: 269).

Defining the needs in education is a complicated issue and no simple linear correlation can indicate the relationship between the need for education and education services. Firstly, the need for education may be largely influenced by the embedded environment and individual expectations. For example, Jesson et al. (1985: 373) have stated that the needs to education present a “U-shape” with social class, which means high expectations of education among people in high or low social status areas. Secondly, the need for quality and quantity in primary and secondary education is also different.

In seeking a just access to health care, Daniels (1985: 36) suggests the notion of fair equality of opportunity. His justification summarises many principles (e.g. procedural fairness, merit, needs) and narrows down the range of justice to equal access opportunities to services, with reference to how substantive equality should be applied in empirical studies. This analysis provides valuable ways to understand equity of access (Daniels, 1985: 59-85). Equitable access should contain three conditions: utilization for needs, equality in process variables, and market availability for a decent basic minimum. The application of the first condition is to identify the potential effects of differences in access. The potential effects include structural features of the medical system (such as the availability of hospitals or physicians) and process factors (such as age, health status, education, income level, insurance coverage level and so on) (Daniels, 1985: 63). The process variables in the second condition refer to information on travelling or waiting time, which are used to reflect people’s realized access (Daniels, 1985: 69). The third point identifies constraints of the market in meeting people’s preferences. It means that some groups may have difficulties obtaining the healthcare in the desired quantity or at the desired time, because market decisions on distributions of services are not implemented in response of consumers’ preferences (Daniels, 1985: 72). Therefore, to accurately define subjective needs, many aspects need to be taken into consideration. Formulating indicators in empirical investigations is one of the main challenges in studies of territorial justice.

#### **2.3.4 Locational discrimination**

Certain people are suffering as a result of social bias caused by their location. Soja (2009: 3) has called this phenomenon “locational discrimination” which persists in spatial structures. Three main causes of locational discrimination are class, race and gender. Essentially, locational discrimination is a series of social phenomena that are caused by spatial attributes. The outcome of locational discrimination is more than a “segregation” pattern; it refers to an excluded social position of a unit that surrounds lives and relationships (Armstrong, 2012: 624). We cannot discuss this without thinking about the essential characteristics of social ties, relationships, lifestyles and even aesthetic values in local places (Harvey, 2008: 23). Thus, exploring locational discrimination among a certain group is a process to understand the social performance of the targeted group in a specific living environment. This social performance entails social relationships, social ties, interactions with other members and participation in political and social activities. The examination of locational discrimination is similar to research on social inclusion/exclusion, social segregation/integration, cultural integration and violence.

At the community level, local discrimination has been concretely explored in terms of the topics of neighbourhood integration/segregation. It aims to know what degree of exclusion in the local environment can be defined as spatial injustice. Accordingly, local geographic features are considered in searching for social phenomena. Many scholars who focus on social justice rarely touch on locational discrimination. They treat people indiscriminately at different locations. Seeking people’s rights and voices also ignores the effects of the specificity of geographic units. In this sense, an investigation from this perspective does not match the purpose of locational discrimination. Recent studies at the community level have referred to the concept of spatial justice, but rarely respond to the link between justice and integration, injustice and segregation.

## 2.4 Conclusion

In line with the historical evolution of spatial justice, the study has reviewed academic outcomes of justice by political, moral, social and spatial aspects. Theoretical investigations of spatial justice have been fruitful, particularly the remarkable works of Edward Soja (2010a) and Peter Marcuse (2009b) (see Chapter 2.3.2.2). These authors also endeavoured to identify theoretical principles in empirical studies of spatial justice. The studies are characterized by an emphasis on spatiality. There is no doubt that this perspective has advantages for exploring the actual situation regarding justice, but also holds difficulties for establishing concrete criteria for measurement with a full interpretation of imagined opinions. The major challenges are to identify an appropriate way to define the needs of territorial distribution (see Chapter 2.3.3) and to define (in)justice in locational discrimination (see Chapter 2.3.4).

Our study attempts to judge spatial justice within a concrete spatial entity, rather than continuing to talk about logistic relations between space and the politic-economic system, or between space and injustice. This study has two objectives: one is to depict the outcomes of the distribution of residents in social housing communities, and the other is to find out the potential factors that may have an impact on the justice of distribution (e.g. locational decisions made by institutional forces, social and economic conditions, residential environment, individual features etc.). Firstly, our study recognises that spatial justice is both an outcome and a process in society. It contains manifold social, political and moral features. In addition, spatial justice functions as a significant tool for maintaining or modifying (in)justice in structures. Then, inspired by framed dimensions in theories and concentrated topics in empirical research, our empirical analysis draws mainly on the applicable structure of Soja (2010a). Nevertheless, relative topics have enlightened us on ways to evaluate spatial justice among social housing residents. These include engagements relating to seeking a spatial association between poverty and population features, and efforts to reveal the physical accessibility of services and the spatial mismatch problem between residences and employment opportunities.

A three-dimensional structure has been formulated for this study to define spatial justice as it relates to social housing residents. Accordingly, three predominant topics will be examined: territorial distributive justice in regard to goods demanded daily, economic inequality in the relationship between jobs and housing, and neighbourhood integration/exclusion locally (locational discrimination). The first two topics derive from territorial distributive justice and the third topic originates from the social phenomenon caused by geographical location. Finally, in addition to structuring dimensions in practice, we try to find out what phenomena may prove the existence of spatial injustice and then try to identify politically based remedies from a spatial perspective.

The first topic, the territorial distribution of basic services, is not only a result of services distribution within research area, but also a topic that relates closely to personal perception and satisfaction. Therefore, our study selects the idea of access to daily facilities to demonstrate whether the distribution of services can meet the basic demands of residents of social housing communities. Accessibility here is shown by physical distance and perceived distance (travel time and travel mode of an individual). The basic need for facilities is implied in the analysis of personal satisfaction with the quantity and quality of services (see Appendices A.2, Questionnaire: H20-H40). These questions are set in terms of a five-point scale from negative to positive. We assume the more positive categories the respondent indicates, the higher the level of fulfilment of basic needs.

The second topic, economic inequality, is a sub concept of distributive injustice which responds to the relationship between job and housing. Because the indices included (e.g. accessible job opportunity, distance to labour market and income level) tend to be driven by market forces, it makes more sense to separate economic inequality from the distributive justice of goods (e.g. education, medical services etc.) that are highly organized by political power.

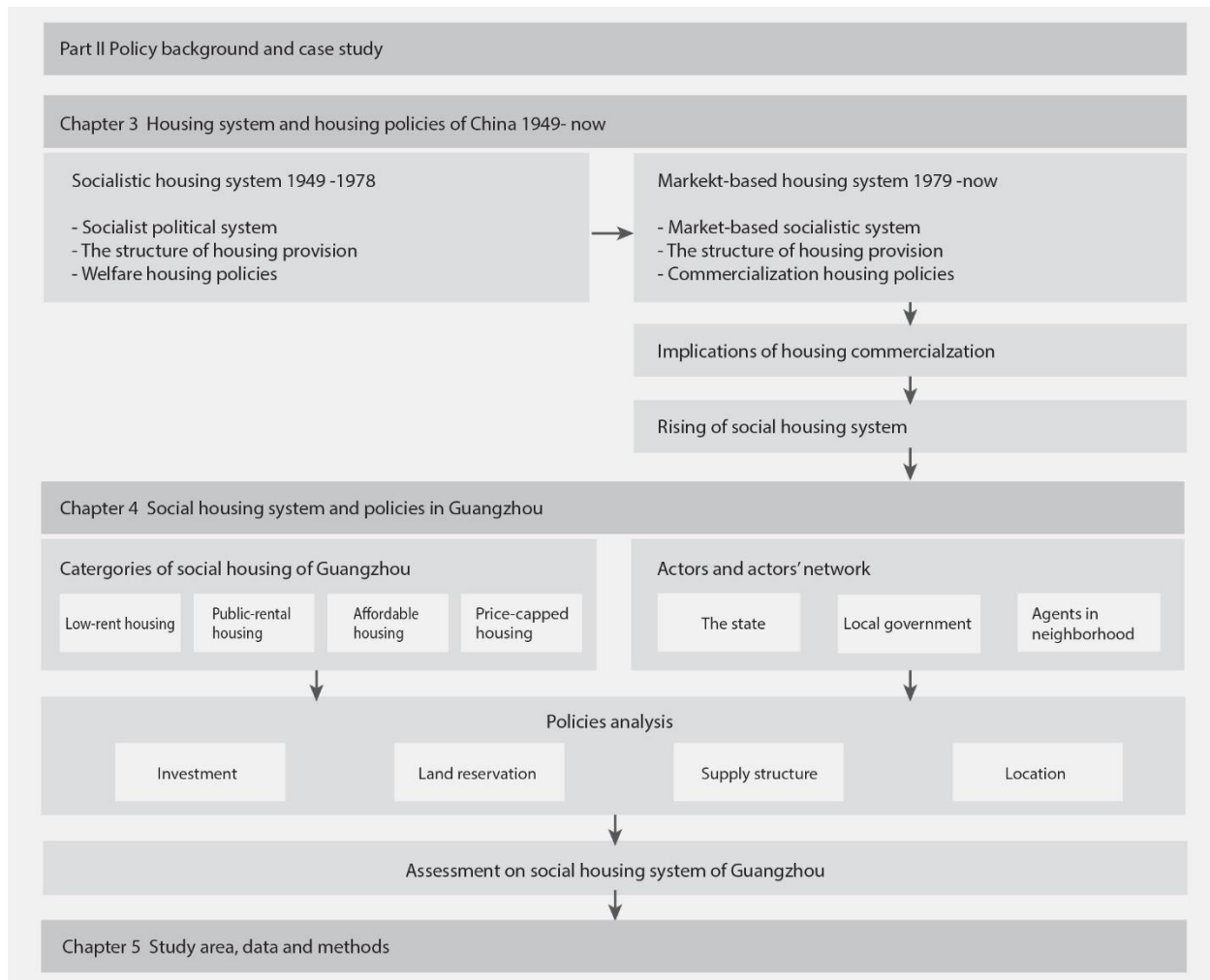
The accessibility to employment not only contains the static aspect of opportunity matching (accessibility of jobs and labour market), but also involves the dynamic aspect of reorganizing the spatial relationship between job and housing. Distribution of job opportunities may be strongly influenced by market choice, and individual decisions are particularly important in shaping the job–housing relationship. Therefore, this measurement operates from two directions: to examine the connectivity between workplace and housing location on the basis of map and commuting data (see Appendix A.2, Questionnaire: B1-B9), and to find out from individual the effects of the actual situation.



The last topic, neighbourhood integration, aims to address locational discrimination. Spatial justice not only displays spatial patterns but also social facts. The residential location may result in various social effects (e.g. social polarization, social bias along class, race and gender, residential segregation and marginalization). The specific heterogenous units are presumed to correlate highly with the risk of segregation from outside society. The social housing community, within which people with weak economic abilities centrally settled, can be seen as such a geographic pattern. Thus, it is meaningful to test the segregation of the community in order to know whether residents are socially excluded by reason of the residential unit. This part draws mainly on survey data on the social housing community to reveal social participation (see Appendices A.2, Questionnaire: E1-E17), social communication within community (see Appendices A.2, Questionnaire: D1-D12) and between different communities (see Appendices A.2, Questionnaire: F1-F19), sense of community (see Appendices A.2, Questionnaire: D13-D23), social trust (see Appendices A.2, Questionnaire: G3-G8), social climate (see Appendices A.2, Questionnaire: E18-E22) and satisfaction (see Appendices A.2, Questionnaire: H1-H52).

## **Part II**

### **Political and Geographical Context**



**Fig. 3.1 Outline of Part II policy background and case study**

Source: own draft, 2015.

These two chapters focus on the development of the housing system in China and its operation at city level (see Fig. 3.1). Housing provision is a multidimensional issue that includes all political, economic and social agencies. In order to identify justice and influence correctly in further analysis, it is crucial to firstly outline the progress, functions and relationships between the various groups. Chapter 3 draws on the progress of the housing policy model in China, in which we present the polity, housing provision structure, agencies and two chronological periods: the socialistic housing system during 1949–1978 and market-dominant housing system since 1978. After recognizing this background of the evolving housing fabric, Chapter 4 focuses on the constitution and operative mechanism of the social housing system in Guangzhou. This city-based housing system was officially put forward in the second period because of the shortages in provision in the market-housing dominant system in the settling conditions for vulnerable groups. Guangzhou, a regionally centralized city, has a large number of socioeconomically disadvantaged people caused by urbanization and resulting polarization. It has been politically defined as a pilot city for advancing the social housing system. The social housing system in Guangzhou is mainly targeted at resolving the resettlement difficulties of local middle- and low-income families. Essentially, it serves as a supplementary model for the market-dominant housing system, and is oriented by political force. Local government is responsible for identifying targeted groups, housing patterns, residence locations, later-period management and surveillance of the indigenous circumstances. Therefore, a city-based study not only informs us about the supplying structure, actors' network and policy context of the current model in Guangzhou, but is also helpful for obtaining a glimpse of the specifics and the potential problems that may implicate mechanisms in other cities. These two chapters will focus on the following questions to elaborate the features of the Chinese housing system and the city social housing model:

- What was the development course of the Chinese housing system after 1949? How many systems have been operated?
- Which organization or group has been involved and what role did they play in the different systems that developed over the past decades?
- How does the local government intervene in the city social housing system? And how do other actors function and interact?
- How does the local authority of Guangzhou define various social housing types (i.e. low-rent housing, public rental housing, affordable housing and price-capped housing)?

What socio-spatial effects have been highlighted by the political structure and the design principles?

### 3 The housing system and housing policies of Guangzhou, 1949 – now

Housing progress in China after 1949 can be basically divided into two phases in terms of political structure that prevailed: the socialist polity from 1949 to 1978 and the market-based socialist polity after the reform of 1979. Accordingly, the housing system was remodelled with the reform of polities, so we regard 1979 as a watershed of housing provision. In first phase, the dominant housing type is the public housing whose property right was completely owned by public sectors such as administrations, state-owned enterprises and collectives. That is to say, private housing and a housing market did not exist at this time. A turning point occurred in 1979 when the polity reform led to the creation of a housing market. Trading in the housing market has gradually replaced public housing provision by government during the time of socialist polity. With the aim of establishing a prosperous housing market, ministries, public sector, private actors and so on, have readjusted their roles in the housing system. The process has advanced the formation of a new actor network, as well as a series of favourable market policies issued by government at all levels. All of these actions have encouraged housing privatization and have energized housing sales in the real estate market.

Many studies have focused on the course of housing system reform and its impact in past two decades, but little attention has been paid to the housing system before the reform. Chapter 3 explains this context in terms of the background, polities and actors and their relationships in two phases chronologically. Numerous studies have concentrated on policies for housing reform and their implications afterwards, such as the representative depictions of Wu and Gaubatz (2013), Zhu (2014) and Wang (2011) of housing policy advancement in the post-reform period. Adding to the policy research, attention is also paid to further implications: Wang and Murie (2000) have illustrated the spatial and social changes resulting from housing transformation; Tian and Wong (2007) have argued that the socio-spatial housing differentiation of Shanghai derived from market-led system, in which they also put forward the significant role played by the institutional system. Ye and Tian (2010) has criticized the negative outcomes of housing marketization reform such as unaffordability and the worsening housing conditions of weak groups using quantitative analysis. Additionally, the unfavourable results have been examined in detail in other studies. Man, Zheng and Ren (2011) focused on the rise, finance, affordability and consumption issues of the housing market during housing reform. Chen (1996) has explored excessive price–rent ratios after housing commercialization. Yu (2006) has manifested widening housing gaps in socioeconomic changes and progress via the analysis of census data and Wang (2000) assessed the reform in housing accessibility issues among the urban poor.

With respect to the earlier system, Kirkby (1985: 164-179), and Chiu and Lupton (1992) have examined the progress in housing development during 1949-1978. However, these discussions likely overlook the link between outcomes and the housing system so that a detailed and systematic investigation of mechanisms is still lacking, as do critics of the unquestioning assumption of bringing in market mechanisms to solve the housing shortage (Ball, 1988). Although “social housing system” is a new term, it originally derives from the welfare housing system which started in 1949 having developed over a long period. Additionally, the socialist housing system of 1949–1979 was closely associated with the national economic and political system and had a profound impact on housing reforms up to the late 1990s. It is therefore worth reviewing the earlier style of housing provision.

#### 3.1 The socialist housing system 1949–1978

##### 3.1.1 The nature of the socialist institution

In 1949, when the People’s Republic of China was established, China’s economy had reached an all-time low. With the intention of making a rapid recovery from the war, the state of China started learning from the experiences of the soviet regime about developmental tactics. At the same time, the national government endeavoured to build up a socialist polity system which prevailed in China from 1949-1979, and is well known as a centrally controlled regime (Wu, 2015). The socialist concept originates from Marx’s and Engels’ ideology, which is an anti-capitalistic and anti-market polity model. The key to the regime is the communism which insists on public ownership rather than private ownership (Zhang, 1997). Polity in China was characterized by the planning economy model. During Mao’s era, increasing confiscation

became mainstream, where the public sector functioned as the dominant force in social and economic development, and the majority of resources were organized by these sectors with their political forces.

In order to have successful economic planning strategies practices, during this institutional revolution the nation was shaped as a hierarchical administrative system (Deng, Hoekstra & Elsinga, 2004). The actors in this structure were referred to as work units<sup>2</sup> (*Dan Wei*), which included the ministerial sector (refers to from top to down, the central government/national government, local governments, street-administrative institutions), state-owned enterprises and collectives. Division of labour in this system was based on stratified statuses: the central government set the economic goals and carried out policy principles, while the rest of the work units were responsible to putting in action. In detail, the administration is centrally directed by the national government which holds full control of the institutional structure, social development and the direction of the economy. This top work unit is entirely responsible for giving commands, designing master policies, organizing funds and welfare. Then, these top activities are passed down to inferior work units. Accordingly, local governments, state-owned enterprises and collectives draw up executive strategy within their administrative spheres. The size, rank and performance of the work unit are closely associated with their accessible investments, and in turn affected by the allocative results that are directly linked to employees' daily lives. Housing was one of the critical welfare goods and its provision and distribution were organized mainly by the administrative forces of work units. A study of the operative mechanism of the housing system will enable an exploration of the nature of Chinese political system, the role of political power in economic activities, and its effects to people's livelihoods.

### 3.1.2 The structure of welfare housing provision

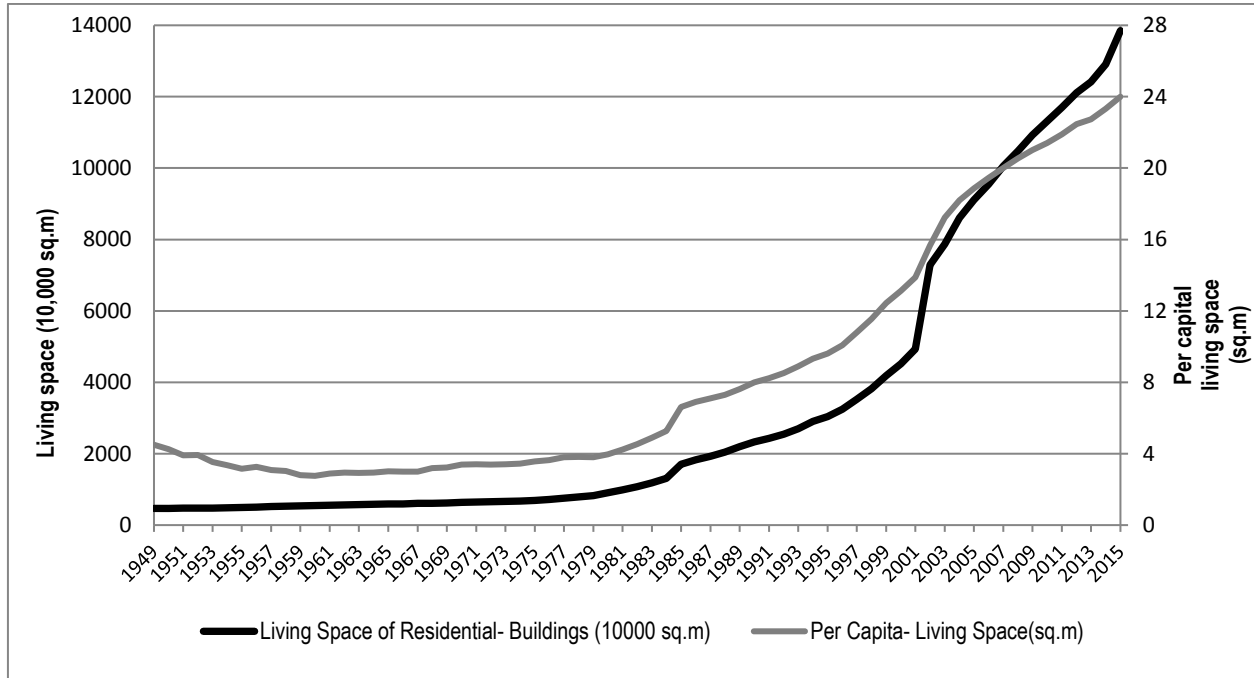
The housing system in urban areas in planned economy times was characterized by public housing provision. This mode of provision in urban areas differed from that in rural areas. In the latter, the collectives distributed land to individuals for agriculture production, housing and infrastructure construction. Housing here was mostly self-built on land parcels for private residential usage and was also privately owned (Wu, 2012). However, in urban area, public housing played a dominant role in the settlement of urban residents as they lacked free land for private housing construction. The economy in urban areas was dominated by industrial production, so any activities were organized to prioritize the maximizing of industrial benefits. Therefore, the distribution of residential land was controlled by local government. Every work unit can obtain land parcels for both producing and residence through a unified and standard process. Then, managers in work units established public housing to meets the demands of the employees involved. In this research, we focus on the housing system implemented in urban areas by indicating its development, operative mechanism, administrative structure, actors, outcomes and drawbacks.

#### 3.1.2.1 Formation of welfare housing system

In the aftermath of World War II, most social property and industrial property had been destroyed, and the serious damage to housing had resulted in severe housing shortage problems. Per capita urban residential floor space was low at 4.5 square metres (see Fig. 3.2). In confronting the problems related to the urgent housing needs, uncontrolled rental prices and unaffordability for urban residents with low wages, the state implemented a policy in terms of which private housing was confiscated and transferred to the public sector, and then redistributed as cheap rent properly as a social welfare according to the need in the long period after liberation in 1949 (Chu & Kwok, 1990: 641). Moreover, central government took most of the responsibility for housing investment, construction and provision. Such housing was defined by public ownership, that is, it was owned and managed by the state. By providing public housing, the state aimed to guarantee a general and even interest across whole society under the limited productivity (Zhang, 1997). In this sense, providing public housing in urban areas represented a welfare-directed housing system.

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<sup>2</sup> Work unit/*Dan Wei*: The term is a general name for the way in which work is organized in China. The term is used to express the entity in which an individual works (Deng et al., 2004). Although *Dan Wei* is still in use to describe all kinds of employment entities (Womack, 1991), we commonly consider the term as one that was widely used in the planning economy era and later the reform era, which includes institutions of state, such as central government, local government and state-owned enterprises (Wu, 2012).



**Fig. 3.2 Living space and per capita living space in Guangzhou, 1949–2012**

Note: detailed numbers are shown for each year in Tab. 3.1. Living space in residential buildings and per capita living space during 1949–2013, Guangzhou.

Source: Own draft, 2015. According to statistical data: 1) Guangzhou Statistical Yearbooks: 50 years of Guangzhou, Tab. 8-3 Floor Space of Buildings in Urban Areas and Per Capital Living Space; 2) Guangzhou Statistic Year Book, 2000 – 2014: Tab. 9-5 Floor Space of Buildings in Urban Districts in Main Years.

The convergence of housing into public ownership was the main principle during 1949 to 1979, but its profound impact on the housing system lasted until 1998 because the state was in full charge of the housing issue. Because data and literature during this period are lacking, limited work has been carried out on housing policies. It is difficult to directly measure and assess housing development and its influences by means of quantitative approaches. In addition, the Chinese housing system was once characterized by the derived policy and the deep intervention of administrative actors. So having a clear understanding of housing policies and the functions of actors is helpful to know the formation of the welfare housing system. Firstly, this study focuses on key policies on welfare housing and summarizes the main changes chronologically. Secondly, we identify the active actors, their roles and interactions in the process of welfare housing provision. The formation of the welfare housing system took place over several stages and was affected by policies of the time. The following demonstrates the three main periods and governmental actions during 1949–1978: the land reform (*Tu Gai*) of 1950–1952, confiscation and public housing provision.

**The land reform (*Tu Gai*) during 1950–1952: transferral to public ownership.** Labour, capital and land are essential elements for supporting social development in the planned economy period (Qian, 2008). To deal with severe land demands both in urban and rural areas, national government on the basis of Marxist theory carried out numerous land policies with the purpose of establishing public ownership in the land sector. Although the confiscation of land had started before 1949, overall land reform (*Tu Gai*) was launched from the end of 1950. In 1949, the state had taken over urban land from former Kuomintang, most urban land parcels belonged to the public sector except for a small amount of land with private housing. Furthermore, the Chinese state attempted to reduce social inequality by confiscating land resources from landlords and redistributing them to the poor (Ding, 2003). This process was widely implemented in rural areas as well as with some private properties in urban areas. By the end of land reform (*Tu Gai*) in 1952, the state became the dominant owner of land in both cities and villages.

The impact of land reform (*Tu Gai*) may be indicated by two aspects. On the one hand, this reform stopped potential private housing construction by controlling trade in land. The transferral of land into public ownership resulted in the

abolishment of the property market.<sup>3</sup> That is to say, land value remained at zero and the output of urban land was hidden in the overall benefits of work units (Ding, 2003). Full authority of the state over urban land made it impossible for private individuals to buy land parcels for new housing construction (Zhang, 1997). Consequently, the 1950 land reform (*Tu Gai*) ended liberal land trade, which controlled the basis of housing construction. Apart from existing private housing, government successfully prevented the possibility of private housing provision. On the other hand, this reform played a dominant role in shaping public housing<sup>4</sup> provision in urban areas. While agricultural production was located in the countryside, most industries were located in the urban areas (Kirkby, 1985: 135). The urban economy concentrated on secondary industry sectors which were closely related to commodities and construction. Urban lands were not separate but integrated into national economic development with fundamental support. The state, as the only owner who controlled allocation rights, not only attempted to distribute land equitably but also for its most efficient use so as to meet the goal of the planning economy. Therefore, land resource in cities were distributed free among various work units. Pieces of land allocated to a work unit consisted of constructive land and residential land. Work units took responsibility for constructing public housing blocks on these residential land parcels near the workplace and provided them to their employees at very low rent. This kind of housing with public ownership was managed by work units and allocated to those who required them as welfare material.

**Confiscation: the convergence of private housing with public ownership.** In order to strengthen the government's control over private property including housing resources, the central government started focusing on transforming private ownership into public ownership after 1952. This confiscation was also called socialist transformation (Zhang, 1997: 437). In early period of the founding the People's Republic of China, private property consisted mainly of self-owned enterprises and medium- or small-scale dwellings owned by private individuals, which were protected by central government. During this time, the state cooperated with the private business sector and supported liberal transitions in the market to provide positive efforts for socialist construction. As expected, the operation of the housing market greatly contributed to economic development and social stabilization in a disordered situation. After a short recovery time during 1949-1950, a series of policies were implemented to encourage the transferral of property ownership from private to public, which is regarded as a significant impetus for forming the socialist system in China. Two documents that were enacted in 1951, "Expropriation of Warlords, Traitors, Bureaucrat-capitalist and Anti-revolutionist" and "Expropriation of Anti-Revolutionary Criminals", marked the start of this process, with the government starting work on property registration and confiscation.

The measures adopted during 1952-1956 mainly included two aspects: restricting the tenant-housing market and purchasing private housing. Firstly, the government purchased numbers of housing stock from the private sector, and included them in the public sector. By 1956 the floor space of housing owned by government had increased to 467,500 m<sup>2</sup> from 17,500 m<sup>2</sup> in 1949 (Housing and Property Management Department, 1989). In 1955, the share of private housing stock was 53.9% in Beijing, 54% in Tianjin, 66% in Shanghai and 61.3% in Nanjing (Zhang, 1997: 437-438). By 1956, over 95% of urban housing was occupied by the state and only less 5% of stock was remained in private hands (Zhang, 1997: 439-440). Secondly, because the national economy at this time greatly depended on private industry and business, central government was being cautious when coping its relationship with the private sector. With worries about failing market control that could destroy stability, the government started constraining housing rent and prohibiting sub-charges. Government's performance concentrated on negotiations between landlords and tenants, in order to finally define a rational rent. However, housing shortages and the absence of policies on rent control resulted in the overwhelming voice of the landlord in negotiation. Overall, confiscation at this time was slowly taking place.

<sup>3</sup> According to policy "The Land Reform Act of China", 1950. Article 27 permitted private management of land, but land was not allowed to be rented or sold between private parties.

<sup>4</sup> Public housing is, from 1949 to 1998, national government funded and local government and state-owned enterprises & institutions (*Dan Wei*) constructed and managed public housing (Wu, 2012). People were accessible to live in public housings of state-owned enterprises & institutions or local government with very little rent. The ownerships of all housings belonged to government and state-owned enterprises, individuals had no right of disposal. Public housing is the main type of welfare housing, which is characterized by work unit based, low rent, well-being attributes, had played significant role in meeting housing demands in planning economy period.



However, the unstable and declining housing provision attracted government attention and resulted in an acceleration of the confiscation process by 1956. Society was still experiencing a severe housing shortage and urgent housing demands. Take Guangzhou as an example: there was a constant decline in per capita living space, dropping from 4.50 m<sup>2</sup> in 1949 to 3.26 m<sup>2</sup> in 1956 (see Tab. 3.1), which gives us a glimpse of the worsening housing problems throughout the country. The serious housing shortage was a result of the following forces. One is the deterioration in private housing stocks. Most housing stocks were in hands of the private sector, dominated in particular by landlords. Due to unprofitable rentals and worries about being classified as landlords under the increasing hierarchical struggle, a large amount of private housing was discarded by owners and became unusable as a lack of maintenance. Another cause was the lack of control of rent levels in the private housing market. According to incomplete statistics, rent had increased two to threefold in cities like Guangzhou, Shanghai and Xi'an (Zhang, 1997: 438, 441). Although rents varied from place to place, there is no doubt that the rent level largely exceeded the affordability of households. Rent in the private market was 50% higher than the rent for public housing in Beijing (Zhang, 1997: 438). In some areas, spending on rent by a household amounted to 20% to total expenditure. This unbalanced situation in the housing market was largely as a result of the lack of pressure on rent from public housing. The owners of private housing refused to rent out properties, stating that it was unprofitable and they were unable to make ends meet. From the perspective of the central government, these problems attributed to the contradiction between private ownership and the public system and inefficient intervention in the private housing system. In Jan 1956, the document "The Report on Urban Private Housing Property and Suggestions for Socialist Transformation" was issued which suggested counting the current housing situation and speeding up the socialist transformation. According to the scale and feature of private properties, three measures were applied in confiscation (The Second Office of Secretariat of the Central Committee, 1956):

- The state took over private housing. Taking over private housing meant that the state had full rights to decide on the allocation, rent and maintenance of such housing but not the ownership. The state efficiently restricted the unstable rent market. The state set a standard monthly rent for living space based on affordability and a maintenance fee (Zhang, 1997: 441). This intervention also broke the linkage between owners and tenants with the rent going directly to the state rather than to landlords. Government distributed partial rent to owners, and kept the rest for the potential costs of maintaining and repairing. This measure implied the replacement of the housing rental market by the state, which effectively controlled housing rent but also added burdens to the state.
- Public-private cooperation. With large private enterprises this takeover of management by the state had the potential of causing risks that might destroy normal operations. Therefore, by building partnership with private industries, government tried to intervene in housing provision. Effectively, the state was not only able to learn skills, but also hold part of the ownership. The stakeholder role played by the state in private enterprises means partial confiscation of the private sector.
- Regulation. Different methods were implemented to confiscate small-scale private properties. The state set related regulations instead of direct intervention to avoid profiteering behaviours in housing rentals.

In 1958, another policy was issued to speed up this process, the "Report on the Transformation of Urban Private Housing". This marked the start of a deepened and complete confiscation of housing. In terms of this policy, all housing in the hands of private enterprises and private housing was required to be included in the "transformed" housing system, and then transferred into public ownership. This process lasted until 1966 when housing market was totally abolished, and the state took over complete control of urban housing investment, construction, distribution, maintenance and management (Chiu, 1992). In the aftermath of 1966, the public sector became the predominant manager of the housing system. This system was characterized by the entire provision of public housing in urban area by the public sector (e.g. government, state-owned enterprises, collectives and so on), and continued into the next decade up to 1979. The involvement of the public sector in private housing continued for nearly 30 years: an early slow and constant process from 1952–1956, a stepped-up period from 1956–1966, and a stable period up to the end of planning economy time in 1979. Confiscation transformed housing ownership completely public housing, thus reflecting the early notion of welfare housing provision in China. In addition to the outcome that the public housing system enabled housing demands in the planning economy time, its experiences had profound effects on the formation of the subsequent welfare housing system after 1979.

**Developing public housing provision.** The land reform of the early 1950s made the public sector a vital actor in housing provision. The activity resulted in the disappearance of the land market to some extent, and also indirectly reduced the chance of new private housing construction. Instead the private housing rental market being the main force, public housing was greatly supported by the government and gradually became an important form of urban residences after land reform. Owing to the definition of land as a welfare good, the state distributed land parcels free to work units to support their industrial production and lives. Accompanying the allocating of land parcels, the work units were commissioned to supply public housing to their employees. They were required to build and to supply houses at low rents directly to the workers involved. Each work unit was a self-contained society rather than just a place for working. In this sense, housing construction in a work unit was not an isolated livelihood issue but a matter that was incorporated in its economic development. Public housing provision during this period was a project-oriented practice in economic planning (Wang, 1995). This work unit-based public housing system was characterized by welfare provision. It dominated China's urban housing system up to 1978 and its influence lasted until 1998.

However, prior to 1978, the welfare housing system experienced a very unstable time. The first Five Year Plan (1st FYP), 1953–1957, was a time of rapid housing development. At the time, its share of housing investment to total investment reached a peak of 12.3%, with rate increasing between 1949–1952 to 768.5% (see Tab. 3.2). The government started launching certain newly built public housing projects across inland China. Each work unit carried out its own housing plan and distributed houses based on the number of workers. Central government did not provide funds to work units for housing construction, so the investment had to be self-organized. Local government used revenue from industrial and private housing rentals to invest in public housing model. And state-owned enterprises and collectives depended mainly on surpluses of production. This mechanism led to housing quality relying on the work unit's economic performance. Limited funds, increasing housing demands, advanced housing material and technology together contributed to advocating for multi-storey dormitories. Work units were not only the owners of public housing, but also took full responsibility for housing allocation, management and maintenance. Although the living space was not large, public housing was a reward for employees with good work performance. Work units linked qualification for getting housing and individual contributions together, which meant that public housing acted as a stimulus, motivating employees' working activities.

Following this short growth period, the welfare housing system went into a significant and prolonged decline between 1958 and 1978. Because of the emphasis on industrial construction in the planning economy time, the housing system was regarded as a "non-profit sector". Owing to both the serious neglect of new housing construction and concerns relating to maintenance of the existing housing, favourable housing conditions that could not be met by the welfare housing system. According to the data on declining per capita living space in Guangzhou, from 1957 the data began falling and reached its lowest level for over 10 years (see Fig. 3.1 or Tab. 3.1). Though housing shortage problems started appearing, they were still commonly unnoticed and only a small amount of investment went into new housing for cadres and leaders. During the Great Leap period of 1957–1960, the situation became even worse. Unprecedented attention was paid to industrial investment at this time, simultaneously leading to the stagnation of housing development. In Guangzhou, the proportion of housing investment to total investment was 12.3% in 1953-1957; this index dropped to 5.6% during the Great Leap period 1958–1962 and 6.3% during the Cultural Revolution of 1966-1976 (see Tab. 3.2). As we know, the ideology of socialism addressed benefits for the nation and collectives. Personal sacrifices were neglected as well as demands for housings. To conclude, welfare housing system prior to 1979 was in its formative stage but hardly developed.

Year	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
Living Space of Residential Buildings (10,000 m <sup>2</sup> )	468.3	470.8	471.7	473.9	480.1	487.3	492.6	500.6	521.0	529.4	537.6	548.5	560.7	565.9	572.6	580.6	595.5
Per Capita Living Space (m <sup>2</sup> )	4.50	4.25	3.91	3.93	3.54	3.35	3.16	3.26	3.08	3.04	2.80	2.76	2.89	2.95	2.93	2.94	3.01
Year	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Living Space of Residential Buildings (10,000 m <sup>2</sup> )	596.8	606.4	611.0	622.2	634.2	644.0	651.1	660.88	674.1	692.0	716.1	751.0	788.4	828.2	907.7	988.2	1076.4
Per Capita Living Space (m <sup>2</sup> )	3.00	2.99	3.19	3.23	3.39	3.41	3.39	3.41	3.45	3.57	3.65	3.80	3.82	3.8	3.97	4.23	4.54
Year	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Living Space of Residential Buildings (10,000 m <sup>2</sup> )	1184.5	1309.2	1700.7	1828.3	1931.7	2048.1	2199.1	2327.6	2431.2	2550.5	2700.2	2903.9	3043.7	3246.4	3524.2	3817.2	4186.6
Per Capita- Living Space (m <sup>2</sup> )	4.90	5.27	6.62	6.90	7.11	7.29	7.62	7.99	8.23	8.51	8.89	9.33	9.61	10.08	10.79	11.55	12.44
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Living Space of Residential Buildings (10,000 m <sup>2</sup> )	4515.4	4934.2	7289.2	7874.5	8606.6	9107.2	9546.6	10058.0	10480.9	10928.7	11310.3	11695.6	12114.6	12418.9	12909.24	13849.18	
Per Capita Living Space (m <sup>2</sup> )	13.13	13.87	15.67	17.23	18.19	18.87	19.45	20.00	20.54	21.01	21.40	21.89	22.46	22.73	23.32	24.00	

**Tab. 3.1 Living space of residential buildings and per capital living space during 1949- 2013, Guangzhou**

Source: Own draft, 2015. According to statistical data: 1) Guangzhou Statistical Yearbooks: 50 years of Guangzhou, Tab. 8-3 Floor Space of Buildings in Urban Areas and Per Capital Living Space; 2) Guangzhou Statistic Year Book, 2000–2016: Tab. 9-5 Floor Space of Buildings in Urban Districts in Main Years.

Tab. 3.2 Urban housing investment during period of 1949-1998, Guangzhou and China

Unit: 10,000 yuan	Guangzhou city area <sup>a</sup>				China <sup>b</sup>
	Total investment	Housing investment	Share of housing investment in total investment	Increase rate of housing investment	Share of housing investment in total investment
<b>Recovery period</b> (1949-1952)	6,753	707	10.5%	/	/
<b>1st FYP</b> (1953-1957)	49,757	6,140	12.3%	768.5%	9.1%
<b>2nd FYP</b> (1958-1962)	108,373	6,115	5.6%	-0.4%	4.1%
<b>Adjustment period</b> (1963-1965)	46,782	4,910	10.5%	-19.7%	6.9%
<b>3rd FYP</b> (1966-1970)	64,513	5,938	9.2%	20.9%	4.0%
<b>4th FYP</b> (1971-1975)	153,532	9,718	6.3%	63.7%	5.7%
<b>5th FYP</b> (1976-1980)	369,312	47,884	13.0%	392.7%	8.9%
<b>6th FYP</b> (1981-1985)	1,080,481	309,424	28.6%	546.2%	missing
<b>7th FYP</b> (1986-1990)	3,037,051	758,374	25.0%	145.1%	missing
<b>8th FYP</b> (1991-1995)	12,949,086	3,931,649	30.4%	418.4%	missing
<b>1996-1998</b>	16,779,212	4,782,488	28.5%	21.6%	missing

Note: FYP is the short name of “Five Years Plan”. Five years plan was put forward by central government in economy planning. During 1949-1979, most data were collected and counted with unit of each five year. See details in Appendices A.7.

Source: Own draft, 2016, according to <sup>a</sup> Guangzhou Statistical Yearbook: 50 years of Guangzhou, Table 4-9: The fixed investments of city area; <sup>b</sup> China’s Statistical Yearbook 1981, Volume 6: Capital construction: Investment in productive and non-productive construction over the years, p. 309.

### 3.1.2.2 Actor network in the welfare housing system

In terms of socialist polity, various administrators or groups managed the running of Chinese welfare housing system. Being a welfare good, the investment, construction, allocation, maintenance and management of public housing were totally governed by these authorized actors with public attributes. Therefore, to investigate the role of the actors involved and their functions in operation may contribute to sketching the power structure of this centrally controlled system. By demonstrating an actor network, this study elaborates on two aspects: the role of the actors involved and the interaction between them in the provision of public housing.

**The role of actors.** From 1949 to 1978, the housing provision system experienced constant progress. This was characterized by the increased importance of public housing provision and a decline in the private housing market. During these 30 years, the market operation mechanism shrank greatly and was taken over by the government. As to housing provision, the advocated process of merging and transferring private housing from the open market to public management established the dominant role of public housing. At this time, both the dominant public housing provision and incomplete market provision demonstrated welfare features. Housing rents were decided or indirectly managed by the government rather than by an autonomous outcome of the market mechanism. Therefore, although the private sector once functioned in the private housing provision system, the main role was now played by the public sector in terms of the construction, allocation and management of urban dwellings. As shown in Fig. 3.3, there were two ways for recipients (employees and urban residents) to attain housing resources: the dominant way was to accept public housing that was allocated and directed by local government, state-owned enterprises and collectives; the other channel was to lease private housing in market. The general framework of important actors shows a hierarchical and top-down system (see Fig. 3.3). The state, local government, state-owned enterprises and collectives comprised the different levels of the public sector and had different responsibilities in public housing provision. At the same time, private housing provision included private enterprises of various scales and housing owners, and they supplied a small

number of dwellings with intervention from local government. The provision responsibilities rested mainly with local government under central government control (Chen, Yang & Wang, 2014). Nevertheless, these stratified actors had different responsibilities and interacted in a special way. The following discussion focuses on the function of each actor in the housing provision system.

- The state: policy maker and land provider

In the socialist system, the state is the top administration in the political structure. The state has multiple roles. The main housing type in urban areas was public housing, which aims to guarantee basic residential conditions for workers. Such residences are deemed to assist in efficient production and maximum economic benefits. The land reform of 1950 led to that the state becoming the only owner of land and property. The state allocated land parcels for housing construction to work units and directed them to house their employees. Public housing provision was proposed and assigned by the state. Therefore, the state played a major role as the housing policymaker and land provider (Man et al., 2011; Wu, 1996; Wu, 2012; Chen, Yang & Wang, 2014).

- Local government: dominant executor

In both the provision of public housing and private housing, local government played a significant role. In the public sector, local government was one of work units at city level. It undertook the responsibility for offering public housing to employees involved in the government system. The role of local government here is same as other work units. It was a multifaceted actor; not only an investor, but also a builder, owner and manager in the provision of public housing. In other words, local government played a role as a regulator in the private housing system. Administrative agents intervened in the private housing market in the planning economy system. As the basic administrative organization, local government was the main force in regulating local rent and managing housing stocks (Man et al., 2011; Wu, 1996; Wu, 2012; Chen, Yang & Wang, 2014).

- State-owned enterprises and collectives: provider

State-owned enterprises and collectives were two main types of work units. As public housing providers, they not only were responsible for collecting funds, but for the entire management of housing property. They acted as investor, builder, owner and manager, whose duties referred to housing investment and construction, allocation, maintenance and management (Man, J. Y., et al., 2011; Wu, 1996; Wu, 2012; Chen, Yang & Wang, 2014).

- Private enterprises: provider

For quite a long time in the planning economy, the properties of private business were protected by the state. Even during the confiscation movement, the state only regulated the rent on their housing rather than the ownership. The private sector was still the owner of the housing blocks. Therefore, it acted as the provider in offering private housing.

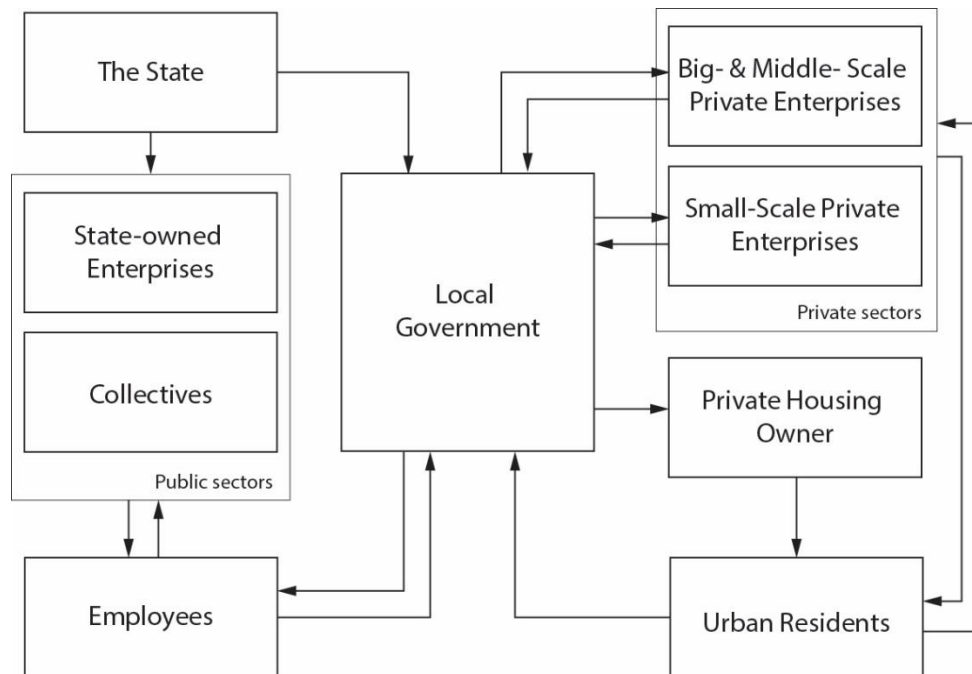
- Private housing owner: provider

Similar to the interference of government in private enterprises, government regulated the rent level of private housing. The degree of confiscation of these individually owned blocks was deeper than the housing properties of private enterprise. Owners merely played the part of provider with no rights with regard to deciding rent, earning rent and repairing housing.

- Employees and urban residents: beneficiary

Employees of work units were able to rent public housing from their employers at very low rent. The rest of urban residents could rent private houses in the housing market.

**Interactions among actors.** In the urban housing system, actors can be basically classified into two groups: public actors and private actors. Although local government functioned in both groups, the other actors worked separately in the two groups. In essence, there were two pathways for housing provision – the welfare housing system and the market housing system.



**Fig. 3.3 Actor network of the welfare housing system in China, 1949-1978**

Source: Own draft, 2016.

*Public housing provision.* The state council, local government, state-owned enterprises and collectives comprise the actors in the public housing system. With an overall view on national development, the state directed and controlled the housing provision process. In line with the defining determinants of the current housing problems, the state formulated housing policies and then commanded inferior work units to compile detailed implementation methods to fulfil them. According to this top-down arrangement, the land parcels for housing construction were allocated to every work unit. In this sense, the function of the state in public housing provision was as master director rather than playing a role in detailed executions.

Organizations at lower level of the institutional system were the actors who put policies into practices. Local government, state-owned enterprises and collectives built their own residential stocks for their employees in terms of policies enacted by the state. Due to the self-organizing mechanism for funding and construction, these work units were allowed to have ownership and disposal rights over housing property. Allocation became the main interaction between work units and employees in housing provision. Length of service, performance and contributions made by individuals when working were used as references to judge whether the qualified to access public housing. Employees who were living in work unit housing only paid a small amount of rent to employers for further costs on maintenance.

*Private housing provision.* In line with the ownership of property, there were two types of private housing: residential housing stocks owned by private enterprises; and those owned by individuals. Enterprises and housing owners were the main agents in housing market. Because of the policy forbidding ownership transactions, no transferral was unpermitted except leasing. That is to say, the only interaction between housing owners and those demanding housing was through leasing in the market. However, local government interfered with the relations between leaser and tenant in varying degrees. The unstable operation of the rental market caught political attention; to avoid possible negative impacts brought by rent confusion on the national economy, the government combined rental processes in different ways. Firstly, government brought out a standard rent amount, which was set at a low level, after balancing affordability for residents and maintenance costs and benefits. At the same time, local government worked as supervisor to guarantee the implementation of rent policies in private enterprises. Secondly, local authorities took direct control of the rent circulation of small housing stocks owned by individuals. The government not only intervened in deciding the rent level, but also managed the allocation of the rent. It is noticeable that the rent went directly to local government instead of the leaser. Local government deducted maintenance costs and the money over was given to the house

owners. That means leasing behaviour between the two actors (leaser and tenants) in market had changed, now operating with three actors (local government, leaser and tenants).

The actor network indicates how the actors in welfare housing provision interacted before 1979. The multifaceted functions of local government can be clearly identified as the provider of public housing and the regulator of private housing. Work units with public features were given full abilities to control public housing provision, while the rights of private owners over their houses were partially deprived by government. Nevertheless, in contrast to the self-directed options of tenants in the market, employees of work units lacked an autonomous choice of dwellings. The allocation progress in work units determined that the qualification of employees for housing was a partial positive process linked to personal performance.

### 3.1.3 The features of the welfare housing provision system

**Dominant role of the local government.** This housing provision system is firstly characterized by the dominant role of local government. As we know, this is the subordinate administration sector of central government, which led city development in the planning economy era. No doubt, local government was the public sector with an obligation to ensure housing provision in the administrative area. To meet this goal, local government took charge of supplying housing blocks for their employees and was responsible for collecting the rent on private housing. In its institutional structure, local government was an administrative organization situated between the state and the employees, and in the market system, it played the role of a manager who intervened in the relationship between private owners and tenants. Local government organized nearly all housing affairs in the urban areas to certain extent, whether private or public. Therefore, the absolute dominant position of local government is a significant feature of the welfare housing system.

**Work unit-based public housing provision.** Welfare housing provision operated as a work unit based mechanism, as private rental housing market did exist but was not completed at this time. In the market, private owners lacked disposal rights over their housing. Instead of new private houses being produced, great efforts were made in public housing construction. However, the lack of statistical data during this period has added to the difficulty of examining precisely the role of the work unit in public housing provision. In terms of data from the Ministry of Construction about the housing provision structure in 1979, public housing took up 48.5% of the housing floor area, municipality occupied 31.6%, and private housing occupied 19.9%. The percentages of three categories changed into 53.6%, 28.7% and 17.7% by 1982 respectively (Kirkby, 1985: 166). Despite these data being compiled after the reform, they still give us a glimpse of the once dominant status of the public housing. Accordingly, the work unit which took charge of public housing played a primary role in housing provision. This provision structure was a self-sufficient system, and from the perspective of spatial relationships, housing and workplace were spatially close to each other.

- Self-sufficiency system

As indicated above, the work unit was the basic supplier of public housing. Investing in the public housing model was a mission that has to be fulfilled. Besides the normal business, housing provision was an inherent economic input for work units. Managers in work units needed to organize housing funds from a surplus of their own production, and then decided on housing patterns and criteria for qualifying employees. Since every work unit had its own duties in public housing construction, the provision was mutually independent. In this sense, such provision at this time may be regarded as a self-governing system (Wu, 1996).

- Housing near workplace

Land allocation was controlled by the state, which distributed land parcels according to the amount demanded by the specific work unit for production and residences. As a result, land parcels received were spatially concentrated or adjacent. Work units built up their own housing stocks and factories on granted lands, which resulted directly in a spatial pattern where housing was situated near the workplace (Wu, 1996). Nevertheless, this spatial feature is also the result of the production-centred idea. Guaranteed housing conditions and short distances to the workplace increased work efficiency.

**Allocation according to individual performance.** Welfare housing was characterized as non-profit and the dominant housing provision system (Wu, 1996). In situations of general housing shortages, “needs” were rarely considered by the allocator; rather employees’ status, working age, working performance and output were considered. In the public sector, government issued a series of documents on the way the distribution of public housing should be conducted and the abuse of the limited housing stocks should be prevented (Wang, 1995:63). The distributive methods adopted were based on personal social status and contributions made to production. Top leaders and people who made the greatest contributions were ranked as first level, ordinary leaders and managers took second place to access middle-level houses, and ordinary officers and employees were listed at the third level. To sum up, allocation of public housing was in line with the individual performance at work. Even in the market, housing was not regarded as a commodity but as a good with welfare attributes. Intervention by government meant that allocation was not need-oriented as in common market system. The freedom of making choice in market was disrupted by political power to some extent.

**Poor housing quality and low expectations of residents.** Poor housing quality was the result of a mismatch between investment on residence and low lifestyle expectations from citizens. Firstly, the overwhelming focus on economic development had resulted in impropriated investment into residential housing provision, which was underrated. This biased attitude led directly to insufficient housing investment. As shown in Tab. 3.2, the share of housing investment was less than 10% at national level during 1949-1979. And ratios dropped to even lower level in the Great Leap era 1958-1962 and during the Cultural Revolution period 1966-1976. Effects from inadequate funds and the idea of reducing construction costs finally led to the low housing standards and poor housing quality of most public housing. Secondly, a spirit of self-sacrifice was prevalent at this time. Compared with national benefits, personal benefits like the physical need for housing were mostly ignored. The prevalence of self-sacrifice weakened personal expectations of housing quality, which also contributed to poor housing conditions for a long time.

The poor housing quality was not only seen in the small living space but also in the inferior housing patterns and infrastructure. Multi-storey dormitories were the most favoured style (Logan, Bian & Bian, 1999), which was characterized by an exclusively uniform, concentrated residential mode and low-priced rent. Besides, data on per capita living space clearly show the housing shortage problems in the planning economy period. In spite of constant housing construction, per capita living space dropped to 2.76 m<sup>2</sup> in 1960 (see Tab. 3.1). On the eve of reform in 1979, these data had not recovered to the 1949 level of 4.50 m<sup>2</sup>.

### 3.1.4 Sub conclusion

From 1949, the urgent demand for recovery and development after the war rendered the position of government as central in production. Compared to the capitalism, the government of China played dominant role in public housing provision during the planning economy period, rather than intervening to remedy the “market failure”. Rather than being treated as a backup force for fulfilling a national economic goal, housing provision was a work unit-based mode. These work units had the major responsibility for housing construction and supply. The completed housing stocks were owned by work units and people with permission could move in at very low rents.

However, several studies have criticized the welfare housing provision system as bringing problems like the prolonged housing shortage, poor quality housing and housing inequality. Lee assumed problems with policy directives and institutional arrangement (Lee, 1988). He especially examined housing shortage problems from 1949 to 1986, and pointed out the failure of the biased housing investment policies and the remedy subsidy policies. The housing problems were only temporarily relieved but not been eliminated from root. Moreover, some investigations have revealed housing inequality among different work units and individuals (Logan, Bian & Bian, 1999; Renaud, 2004; Wang & Murie, 2000). On the one side, self-governing provision had raised housing inequality among work units. Central government did not provide any fund to work units. The constructed housing quality was determined by the economic performance of work units. The financial source of housing projects was from own productive surpluses or tax from private businesses. So economic benefits of were directly linked to the residential conditions of employees. On the other hand, the allocation process was based on personal performance and status. Person with important positions or with excellent skills had accessibility to better housing assets. This method gave rise to differences in housing quality among employees.



In spite of these problems, the welfare housing supply system relieved the housing shortage to some extent and basically met weakened housing expectations during 1949 and 1976. However, an increasing population and insufficient capital investment exacerbated the situation, which could not be solved by means of the welfare housing system. This trend further stimulated the housing system reform of 1979-1980.

### 3.2 The dual-track housing system 1979-1998

#### 3.2.1 Regime reform: establishment of a housing market

The 10-year Cultural Revolution up to 1976 damaged economic development and social production to large extent. The housing system stagnated during this period as only 6% of the social development fund was put into the housing sector, and residential conditions became even worse with per capita living space falling to 3.65 m<sup>2</sup> which was even lower than the 1949 level (see Fig. 3.2). By the end of 1979, leader Deng Xiaoping launched the market economy, which marked the end of planning economy mechanism in China. Simultaneously, the reform was also a milestone in housing provision as a housing market was allowed and was politically supported by the state. From this time, housing provision was no longer treated as an integrated project of the economic sector but as vital social work. With the housing market growing, the aims of removing housing shortage and reducing government participation were addressed. Market mechanisms were gradually developing to become the dominant force in housing provision. It was a slow progress to advocate housing market on basis of original welfare housing system. Nevertheless, a strong push on policies about land leasing spread from an early pilot model to overall reform in the whole nation. With the purpose of reforming welfare-housing as the dominant system, step-by-step actions like privatization, investment and mortgage, and the marketization of public housing finally contributed to a decline in the role of public housing. During this transformative period, 1979-1998, welfare housing and commercial housing functioned in tandem. We call this provision structure a dual-track housing system.

#### 3.2.2 The structure of the dual-track housing system

##### 3.2.2.1 Formation of dual-track housing provision

The formation of dual-track housing provision showed slow process from 1979 to 1998. After the economic reform, consecutive policies were issued to promote the shaping of the housing market and the transferral of public housing. We will elaborate this process chronologically.

**Decentralized housing investment.** The housing reform started with withdrawing the control of central government over work units and the housing market. At the start of housing reform at the end of the 1970s, the administrative sectors shared the heavy burden of housing investment and construction. This burden was aggravated by the fact that there was no circulating of finances back to the government to fill the gap caused by providing non-profit public housing (Wu, 1996). In 1978, the state made many efforts to mobilize social investment positivity on urban housing, particularly by implementing the policy 'Suggestion of Strengthen the Urban Construction'. In fiscal reform, housing investment was totally dispersed to accumulative funds of local governments and work units. With the withdrawal of national government in housing investment, the components of housing budgets became scattered. Agencies were encouraged to use accumulative funds, such as the involvement of the private sector and enterprises, investment in work units and individuals. According to statistics, the proportion of investment from government in housing construction had decreased to 10.22% in 1992 from 77.82% in 1978 (Wu, 1996).

**Privatization of public housing.** Easing the economic pressure burden on government was managed with the transfer of public housing. The state made great efforts in advocating housing privatization. Owing to low salary levels, the majority of urban residents have very limited affordability. The process was designed to be implemented in several steps, in which the crucial role of in-kind housing gradually declined until completely replaced by 1998. Detailed measures can be summarised in the following points:

- Pilot model

The transformation of the welfare housing system started with a pilot model. By impropriated end of impropriated 1970s, Nanyang city and Gongyi city in Henan province were chosen as the testing ground for building public housing by

private enterprise. Then, another four cities, Shanghai, Xi'an, Liuzhou, Wuzhou and Nanning, were selected as the pilot areas, where policies of public housing privatization were applied in 1979 (Fan, 2008). Employees who qualified were allowed to purchase ownership of newly built public housing. By 1980 the process had spread to 50 cities. It is notable that the selling of public housing operated in parallel with subsidies. The original households that lived in work unit dwellings could purchase ownership from work units at a discount price.

- Declining regulation of the housing market

In June of 1980, the national government issued “the Proposal about the Nationally Capital Construction” (The Central Government & The State Council, 1980), in which it formally passed a proposal for housing commercialization. Private housing construction was encouraged, the housing trade was permitted and private ownership was protected by institutional authorities. The housing market began to flourish with the decline in government regulation.

- Privatization of public housing across China

The policy (The Central Government & The State Council, 1980) also proposed a decline in the control of government of public housing provision. Particularly after the pilot cases, the selling of public housing to individuals instead of renting out was widely adopted. Declining regulation was demonstrated in the transferral of the ownership of public housing to individuals, and housing started to be maintained by private individuals. However, at this time the privatization only referred to ownership transfer from work unit to private individuals, public housing transactions between individuals or any actions for profit purposes were still prevented by government. Despite no duty to manage housing properties, work units still acted as the dominant housing provider. There were two ways to provide public housing: one was for work units to employ housing developers to do the construction (Chai, 2008). Due to holding priorities in applying land parcels at favourable prices, they sub-packaged construction work to real estate companies and then allocated completed dwellings to internal employees at favourable prices. Secondly, work units purchased housing stocks from real estate developers and in turn sold them to workers at discount prices. Simultaneously, local government leased land parcels to market developers at low prices and simultaneously encouraged work units to buy the housing stocks built on these land parcels. No doubt, either way invisible subsidies from the government or work units were incorporated. This “hidden-subsidy” brought placed heavy financial pressure on local government but also held back the next step in privatization to some extent.

- Opening up the second-hand housing market

To ensure accessibility to public housing by more people, especially those who were excluded by work units, the second-hand housing market for public housing trading was permitted from 1994. This policy enabled owners of public housing to sell dwellings on the second-hand housing market after five years of ownership, and they were required to return 30% of the profit to the work unit. Since then, public housing has gradually transformed into a real market good without welfare attributes. Work units and government no longer shoulder a heavy burden in terms of housing provision. Besides the privatization of most public housing, there were still a small number that kept the welfare function to meet the demands of low-income households. To lighten the burden of these houses, the state decided to raise monthly rents to cover some of the costs of housing maintenance (The State Council, 1994: No. 43).

**Rise of the real estate market.** The development of the real estate market happened in parallel to the privatization of public housing, which started with the pilot model in Shenzhen and Guangzhou, south China (Chai, 2008). Prior to 1981, the real estate market in China existed without exploring commercial housing. With the substantial opening of the market from 1982, the Shenzhen government started leasing land parcels to real estate developers and allowed them to construct housing stocks on land parcels (The Standing Committee of the National People's Congress, 1981). At the same time, the government encouraged work units to purchase built dwellings from developers in the real estate market. This process soon spread to other cities, and the establishment of the real estate consists mainly of two steps:

- Land leasing and finance policy from 1988

The formal issuing of policy on land use happened in 1988. The publication of the document ‘the Notice about Further Deepening Urban Housing Reform and Accelerating Residential Construction’ (The State Council, 1998) triggered a nationwide housing reform. The content of this reform referred to land development, housing finance, rent increase,

housing construction and consumption. To ensure the healthy running of the real estate market, the central government paid great attention to both land provision and supporting funds. With respect to land provision, private ownership of urban land was permitted after the learning experiences from the pilot city Shenzhen. Additionally, long-term leases to developers in the real estate market were also approved. The reform of land use formed the foundation for commodity housing construction. However, the functioning of the market at this time was still incomplete. Individual has not actually joined the market and the mainstream of housing consumption was dominated by work units. Most housing stocks were directly purchased by work units because of few households with sufficient ability to purchase commodity housing. As to funding, the government attempted to set up a housing finance programme to support real estate market development. At that time, this effort remained in the test stage and two housing banks were established in the cities of Yantai and Bengbu to provide housing mortgages to private housing developers. The influence of finance policy was comparatively slight. Taking the data of 1996 as a reference, shares of investment by various investors were respectively: the State Council owned 2.7%, loans from private companies comprised 19.5%, foreign investment took up 11.7% and the rest – 66.1% – came from local government and work units (China Statistics Bureau, 1997).

- Housing mortgages and housing provident fund from 1994

In 1994, a complete financial model was carried out which was marked by the issue of policy on deepening the reform in urban housing institution (The State Council, 1994). Not only did developers have access to finance, but individual purchasers were also enabled to buy commodity housing with financial support. Firstly, leasing land was speeded up by fund flows among governments, developers and individuals. Local government obtained benefits by establishing long-term cooperation with developers, and pre-sale modes permitted developers to sell dwellings before completion, which guaranteed timely fund circulation in housing construction. A second measure was the establishment of a housing provident fund system. A housing provident fund is also called a public accumulation fund, a model learnt from Singapore (Hamer & Steekelenburg, 2002). Both work units and workers contributed a proportion to the fund to improve the affordability of commercial housing. It means that payment for a dwelling includes shares from the employee and the employer. The proportion paid by the two sides is decided by the income level of the person and the deduction percentage of the housing provident fund locally. This approach was spread from Shanghai to nationwide (Wu, 2012), greatly promoted by affordability and motivated by individuals' consumption of commodity housing. The next action was setting up of a mortgage system, which enabled house buyers to obtain loans at low interest rates.

These methods greatly promoted the development of real estate. The share of housing investment in total social investment grew to 33.2% and fluctuated around 30.0% until 1998 (see Tab. 3.3). In planning economy period 1949-1980, this index stood at around 10.0% only (see Tab. 3.2). In addition, the number of both real estate companies and employees had a breakthrough especially from 1991-1994 and remained stable in the aftermath (see Tab. 3.4). Private individuals gradually became the main consumers in the housing trade, the share of privately purchased housing showed sustained growth from 32.4% in 1986 to 86.3% in 1994, then fell back to some extent during 1995-1998 (see Tab. 3.5). By this time, the measures of financial support and land leasing had achieved notable outcomes, and the real estate market had basically formed.

Tab. 3.3 Urban housing investment and construction in Guangzhou, 1981-1998

Year	Total amount of Investment (10,000 yuan)	Housing investment (10,000 yuan)	Share of housing investment to total investment	Buildings under construction (10,000 m <sup>2</sup> )	Housing buildings under construction (10,000 m <sup>2</sup> )	Share of housing buildings in all buildings
1981	109,459	36,300	33.2%	729.28	407.45	55.9%
1982	159,310	52,272	32.8%	924.39	568.55	61.5%
1983	187,729	61,179	32.6%	951.83	951.83	100.0%
1984	261,768	70,413	26.9%	1002.58	599.82	59.8%
1985	362,215	89,260	24.6%	1142.77	618.50	54.1%
1986	434,074	99,898	23.0%	1128.04	598.81	53.1%
1987	470,219	100,018	21.3%	1184.29	620.91	52.4%
1988	687,424	171,079	24.9%	1504.86	818.98	54.4%
1989	757,067	214,985	28.4%	1485.48	798.10	53.7%
1990	688,267	172,394	25.0%	1320.86	729.61	55.2%
1991	711,394	190,211	26.7%	1273.60	706.06	55.4%
1992	1,264,888	353,994	28.0%	1607.50	855.15	53.2%
1993	2,468,151	878,418	35.6%	2341.55	1351.08	57.7%
1994	3,768,675	1,271,947	33.8%	3158.44	1775.04	56.2%
1995	4,735,978	1,237,079	26.1%	3426.14	1926.18	56.2%
1996	4,961,794	1,311,832	26.4%	3475.22	2000.34	57.6%
1997	5,415,077	1,519,797	28.1%	3724.06	2224.60	59.7%
1998	6,402,341	1,950,859	30.5%	4067.16	2638.06	64.9%

Source: Own draft 2016, according to Guangzhou Statistical Yearbook: 50 years of Guangzhou, part 4: 24. The investment on fixed asset and housing construction at urban area.

Tab. 3.4 Exploitation of real estate market in Guangzhou, 1985-1998

Year	Number of real estate company	Number of employees	Amount of exploitation investment (10,000 yuan)	Developed land area (10,000 m <sup>2</sup> )
1985	36	1,634	46,472	276.00
1986	60	3,609	52,565	451.00
1987	65	4,833	70,031	0
1988	83	4,933	140,091	0
1989	109	4,896	152,359	0
1990	105	5,295	117,419	0
1991	110	7,083	156,349	0
1992	269	7,444	397,420	0
1993	563	16,667	1,252,387	0
1994	858	18,255	1,894,520	1,778.00
1995	917	25,278	2,091,136	839.00
1996	945	32,310	2,291,640	554.15
1997	977	33,069	2,374,223	474.62
1998	1,212	42,786	2,693,689	398.17

Note: The date of 1981-1984 was not given in statistics. Source: Own draft 2016, according to Guangzhou Statistical Yearbook: 50 years of Guangzhou, part 4: 17. The situation of real estate development.

Tab. 3.5 Sales of commercial housing in Guangzhou, 1986-1998

Year	Sales building area (10,000m <sup>2</sup> )	Sales Housing area (10,000m <sup>2</sup> )				Total	Number of sold houses	Amount of sold houses (10,000 yuan)
		To private		To work-unit				
		area	%	area	%			
1986	72.28	21.70	32.4	45.34	67.6	67.04	8,328	/
1987	70.93	/	/	/	/	60.36	9,093	49,733
1988	90.84	/	/	/	/	77.32	9,476	80,128
1989	100.76	/	/	/	/	92.77	12,587	116,087
1990	114.67	47.50	46.4	54.94	53.6	102.44	13,981	137,945
1991	121.21	67.60	63.4	39.03	36.6	106.63	14,959	162,339
1992	167.27	103.10	71.2	41.73	28.8	144.83	20,296	232,961
1993	203.00	145.00	86.3	23.00	13.7	168.00	18,534	479,665
1994	185.00	134.00	80.7	32.00	19.3	166.00	18,585	633,568
1995	242.00	153.00	73.6	55.00	26.4	208.00	24,673	944,930
1996	262.04	112.88	50.0	112.93	50.0	225.81	27,584	1,338,799
1997	290.88	165.14	64.2	91.92	35.8	257.06	38,297	1,473,022
1998	405.05	200.30	57.3	149.00	42.7	349.30	/	2,074,683

Note: The date of 1981-1985 was not given in statistics. Source: Own draft 2016, according to Guangzhou Statistical Yearbook: 50 years of Guangzhou, part 4: 18. The situation of commercial housing sales.

### 3.2.2.2 Actor network in the dual-track housing system

**Actors' role in a dual-track system.** The housing reform from 1979 to 1998 contributed to the quick conversion from government control to a market oriented system (Wang, 2000). During these changeable times, actors repositioned themselves in housing investment and reorganized their responsibilities in the process of housing allocation and management (see Fig. 3.4).

- The State Council: policy maker and director

To reach the goal of developing a market-oriented housing provision system, the State Council restricted government intervention in housing. Restriction of government control was seen in two aspects: decreased investment and decentralized management. After 1979, housing investment from the State Council had shrunk to such an extent that the proportion of total housing investment had dropped to 2.7% by 1996. When the role of the State Council in the financial system weakened, a series of policies were issued guaranteeing financial accumulation in the market mechanism; for instance, the policies that motivated private investment and self-funding, and policies that created the mortgage system and the housing provident fund. Meanwhile, the central government decentralized housing management entirely to local government and local work units. This localized process was characterized by the move away of upper governance on actual issues, although still giving directive policies. There is no doubt the State Council had changed its role as a policymaker and a master director to support the stable operation of the real estate market in dual-track housing system.

- Local government: secondary director and land provider

With the localized process, local government started to design detailed policies and to modify strategies according to the local conditions. Local authorities no longer functioned as housing providers, but as a second-tier director who was responsible for the detailed administration of housing affairs. Furthermore, the significance of local government was also shown in housing market operation. As urban land is owned by local government, housing developers in the real estate market needed to apply for land use rights. In this sense, the local authority functioned as a land provider.

- Work unit: main purchaser in the housing market

With the establishment of a real estate market, the mission of housing construction was mainly transferred from work unit to developing companies in the market. After 1979, economy reform increased the autonomy of work units. They were gradually able to dispose of surplus production. Because employees' living conditions strongly depended on their work units, most of the surplus was reinvested in housing. At the same time, the development of a real estate market enabled work units to purchase constructed housing stock from market developers. Employees could then buy houses from their employers at a very large discount. The low price of housing greatly improved affordability for workers. In 1990, 85.4% commodity housing was purchased by work units and was in turn sold to individuals (Wang & Murie,

2000). Therefore, the role of work units during this time was as the dominant purchaser in the market. They bought commodity housing in the market and then offered it to individuals as welfare support. Indirect investment in housing stocks made work units a significant organization working between the builder and the demanders in the housing system.

- Real estate developers: builder

It is obvious that housing reform contributed to the development of real estate. However, the main goal of housing provision at this time was to strengthen affordability by urban residents. Limited salary levels may negatively influence the formation of a market. Particularly, the function of housing developers in this market was not as complete as in a normal one. They used the funds from private investment to rent land parcels in the long term and then constructed buildings on them. The consequences of limited affordability was that only a small quantities of commodity housing were sold directly to private buyers. The operation of the market strongly relied on the consumption of work units with welfare purposes. Therefore, the market at this time was unable to function with any real meaning.

- Employees in work units: beneficiary

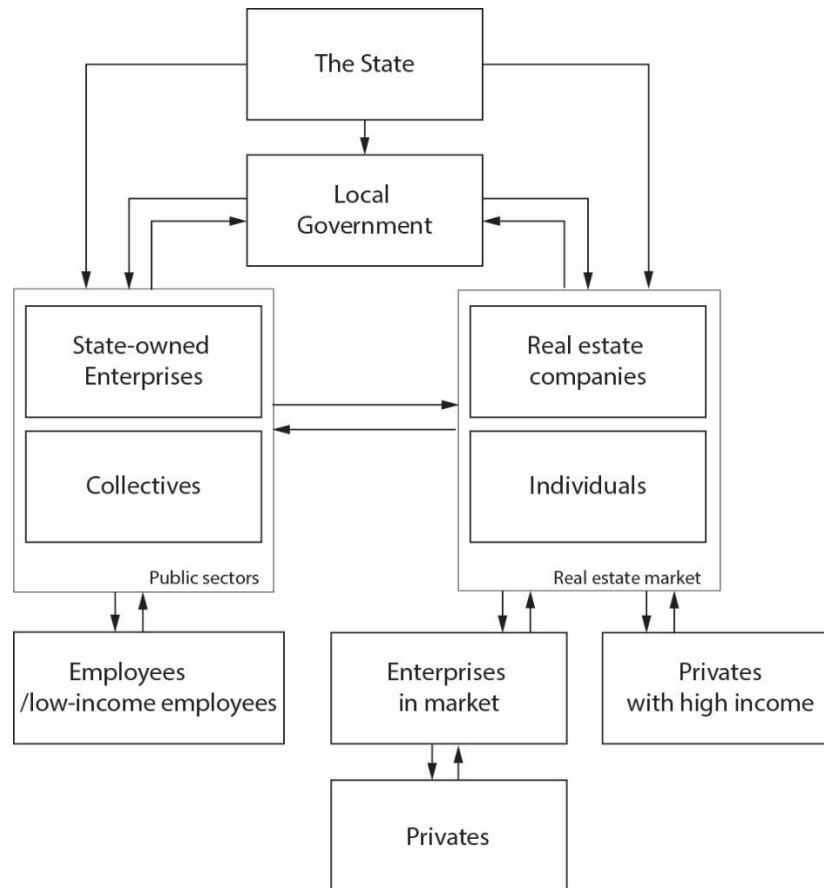
Employees in work units hold advantages in housing purchase owing to favourable financial support from employers. Labourers' access houses by way of purchasing or renting. Firstly, employees who lived in the original public housing qualified to buy the housing from employers at low prices. Secondly, low-income employees were still able to rent public housing stocks. Thirdly, all employees could purchase commodity housing from work units with "hidden subsidies". However, most were reluctant to do this because of large benefits of public housing. In order to motivate consumption, regulations introduced suggested that the rental amounts for public housing be increased. Additionally, some policies launched personal housing loans that focused on serving as a convenience to employees in housing purchase.

- Other private companies in the market and the private buyer: consumer

Private purchasing comprised only small of percentage of housing consumption. Some private enterprises purchased housing stocks on the free market and allocated them to their employees. No doubt, the price was higher than the price of subsidized commodity housing in work units. Nevertheless, several high-income individuals had the ability to obtain commodity housing at a market price.

**Interaction between actors.** Along with the establishment of a real estate market and commodity housing provision, more actors started functioning in the housing system, particularly private individuals and companies. Contradictions between the weak affordability of common citizens and the goal of pushing the housing market required coordination from government or work units. The intervention of work units and government served as a mediator between potential buyers and market housing. On the one hand, subsidies were used to soften the impact from the market mechanism. On the other hand, they supervised market operations to ensure the healthy operation of the housing market. Two approaches to housing provision (subsidized housing provision and market housing provision) gradually took shape after 1979 and functioned during 1984-1998. The interactions between them will be explained below.

In order to relieve the burden on government and encourage market liberation, the State Council transferred the central management of housing affairs to local government. This withdrawal of the State Council occurred along with the increasing role of local government (Fong, 1988). The national government functioned as the top administration in making master policies and tasks. Subsequently, these goals were passed down to the secondary administration: local government. According to the master requirements, local actors had to implement detailed strategies with consideration of the local environment. Therefore, the national government was superior to local government. While former intervened in the housing system, the latter directly controlled actual issues under the orders of national government. With the purpose of improving the poor housing conditions of employees, the State Council issued policies to accelerate the process of housing transferal and privatization, and carried out a series of multifaceted policies (e.g. approving long-term land lease, advocating private investment, creating a loan system and so on) to ensure the stable advancement of the real estate market. All of these policies were localized to city governments who admitted to set detailed approaches to fulfil them in the local area.



**Fig. 3.4 Actor network in the dual-track housing system in China, 1979-1998**

Source: Own draft, 2016.

The interaction between local government and work units happened in two processes: land supply and public housing provision. Since local government owned land parcels in urban areas, they could determine the way to distribute land resources to development companies and work units. In the early times of the reform, work units took priority in obtaining land parcels over development companies because of the original relationships and strong economic assets. As the housing market progressed, this link weakened significantly and was gradually replaced by the association between real estate developers and government. Nevertheless, public housing belongs to the work units, but the actual criteria for rent level and the pace of privatization were formulated by local government. To sum up, we find that local government always led the running of the local housing system, and work units locally were the main actors who were directly managed by government.

At the beginning of 1979, private developers' inability to access land resources disrupted the running of real estate to some extent. This situation changed rapidly after political support from government for land leasing and housing financing. The disposal rights of land parcels were sold to developers in the long-term through bargain, tender and public auction, and then companies in the real estate market were able to construct buildings on purchased land parcels. In turn, payment from companies became an important source of income for government. Nevertheless, the interaction between these two actors also became apparent in the finance system. City authorities stimulated activity of privates and work units to invest in housing developers, and allowed them to invest prepaid capital from buyers into housing construction. It was a collaborative relationship: government created a better conditions for companies from side of material and politics, while companies ensured revenue for local government.

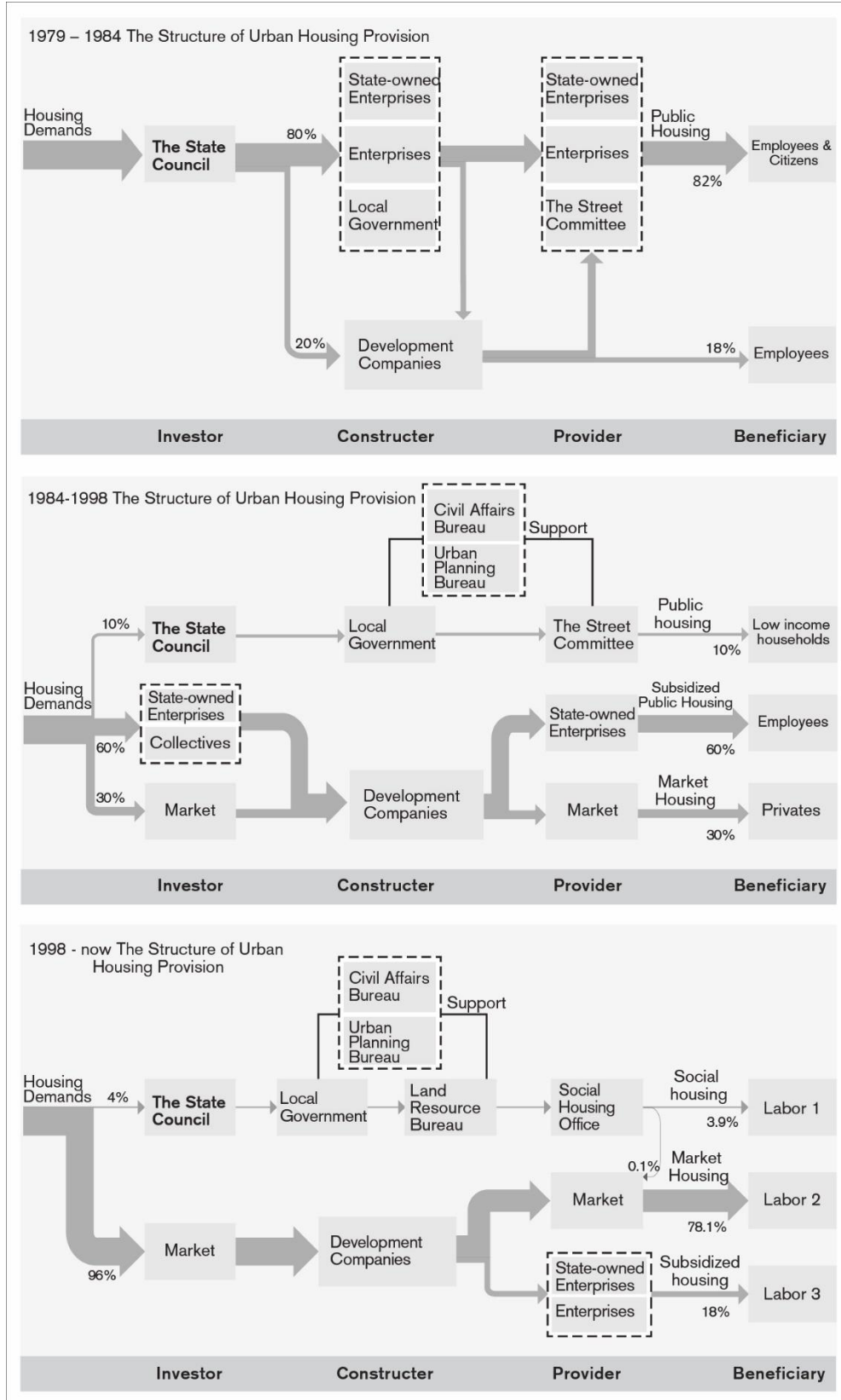


Fig. 3.5 The structure of urban housing provision in China since 1979

Source: own draft, 2016. Data source: Wu (2013) and Zhang (2006)



The interaction between work units and real estate developers was a cooperative one. As mentioned in above, the increasing number of housing developers gradually expanded their shares of the market and took full responsibility for housing construction. However, most urban residents still experienced a lack of affordability in the free market. Therefore, work units used surpluses to buy complete housing stocks from developers, and then sold them to internal buyers at prices much lower than the market price. Accordingly, both parties are dominant actors: government in the role of consumer and housing developers as providers. This interaction ensured the operation of housing market between 1979 and 1998.

Finally, the links between urban residents and various housing providers were demonstrated in the following types (see Fig. 3.4): 1) Low-income employees in work units could rent public housing and normal employees purchased subsidized commodity housing from work units. 2) People who worked in private enterprises could purchase housing provided by companies. 3) Individuals with high incomes could purchase commodity housing in the market. The first type was the dominant way that was practised during these 20 years, although work units slowly decreased their investments. Most of original public housing built before 1979 had been sold to inhabitants, but small amounts of public housing were kept by work units to meet the housing demands of low-income employees in rental form. The last two types of housing provision only took up a small proportion of total housing provision (see Fig. 3.5). As no clear statistical data are available to indicate the percentages of each type, this study only gives a rough estimation based on past studies (Wu, 2013; Zhang, 2006). Accordingly, nearly 60% of housing was allocated by work units. Commodity housing which traded in the market took up approximately 30% and rental public housing for low-income families took up 10%. The share of each indicates the importance of actors in the housing provision system. To sum up, the relationship between residents and various providers was very different in the market system and the work unit system.

### 3.2.3 Successes and consequences of housing system reform

The dual-track housing provision system was an outcome of the transition period, which took place between the previous welfare housing system from 1949-1978 and the later market housing system after 1998. With respect to the housing crisis,<sup>5</sup> during the 1960s and 1970s (Kirkby, 1985: 166-168), in 1980 the Deng administration advised that the sources of housing should be broadened and distribution methods modified. Based on this idea, government implemented the housing reform, which was also the prologue to housing marketization in China. As a result, the opening of the housing market in China indicated housing could be constructed commercially using the market mechanism. This period was characterized by the withdrawal of the state and the emergence of the housing market, which contributed to the gradual formation of a need-directed allocation mechanism. However, in parallel to less pressure from the state and the housing shortage, several problems emerged because of inexperience in the balancing forces of government and the market. In this section, our study lists the primary effects of housing system that operated during this transition period 1979–1998.

**Improved residential conditions.** After introducing the housing market system in 1979, it becomes apparent that per capita living space increased noticeably (see Tab. 3.1). By the end of 1998, this index had reached 11.55 m<sup>2</sup> in Guangzhou, over three times that of 3.8 m<sup>2</sup> in 1979. This upward trend was also demonstrated in other cities in China (Yu, 2006). The positive effects on housing quality was not only the increased housing living space but also the promoted facilities and enlarged share of private ownership. At the same time, commodity housing provided better dwelling conditions than public housing stocks. Compared to the dormitory-type, mass-built public housing provided by work units, people could own private living spaces with kitchens and bathrooms.

**Incomplete development of the real estate market.** The most significant outcome of housing reform was the emergence of a housing market in cities. In terms of the companies and investment amount involved (see Tab. 3.3 &

<sup>5</sup> The Housing crisis is defined by Kirkby (1985) in his book “Urbanisation in China” to describe the time during 1960s and 1970s. In this period, the Great Leap Forward and the Cultural Revolution had result in the neglect of urban planning, the short of housing investment, essential maintain and repair. Though no available data about living space or amount of investment this time, the short provision can be indirectly speculated from the hysteretic development till end of 1980s that only 5.7 m<sup>2</sup> of new living space for each additional urban dweller in past three decades.

Tab. 3.4), it is apparent that boom in the market began in 1990. However, this market was not operating autonomously but was government-directed. This mechanism was representative of governmental intervention in consumption between the market and individuals. Despite the contradiction between market price and insufficient ability was eliminated to some extent, long time intervention implied an incomplete market mechanism, which resulted in slow progress in the housing market. Residents were reluctant to purchase commodity housing in the market but relied on government assistance to consume.

**Heavy subsidy burden on work units.** The appearance of public housing in the market reflected a strong dependence on housing consumption in work units. Under the dominant idea of “soft budget control”, large amounts were invested in commodity housing by work units for their employees. In the 1990s, a large gap existed between the housing price in the public sector and that in the market: the price ratio between subsidized commodity housing and housing in the market was 1:5, in parallel, rent in the public sector to rent in market was 1:5 (Wu, 1996: 1616). As a consequence of continuous support for “hidden subsidies”, work units experienced a financial dilemma. Although a large amount of public housing was sold to residents, the low return barely met expenditure, which reinforced the economic burden on work units. As a result, many work units went bankrupt because of severe budget problems caused by the imbalance between income and expenditure on housing investment. The cost of the deep intervention of work units was the wide loss of state-owned enterprises.

**Emergence of residential differences.** These differences were firstly manifested among employees in different work units. Following economic reform, most urban housing stock – over 85% – was allocated by work units. This implied people’s residential conditions linked closely to the turnover of their work units. Work units with good economic benefits and a favourable surplus would have stronger purchase ability in the market, which would benefit internal labours with better housing location and quality. Therefore, the investment behaviour of work unit became a vital factor in residential differentiation. Normally, the better of economically the work unit was, the better the dwelling conditions would be, while the converse is also true.

Subsequently, residential conditions were stratified by income level and social status. With the development of the housing market, income and education started to play an increasing role in housing accessibility. Income level decided individual affordability to a great extent: high-income individuals had the ability to buy more residential space in better locations, while low-income residents could only access previous public housing near industry with limited space (Wang & Murie, 2000; Wang, 2000). Furthermore, housing allocation within work units was linked to the social status of residents. Employees who occupied an important position or had notable social status, had preference over normal person in choosing housing purchased by employers. The criteria of distribution, which relied on economic factors and social factors, resulted in spatial and social differentiation in terms of residence.

### 3.3 Market-dominated, multilevel housing system: since 1998

#### 3.3.1 Formation of the market-dominated housing system

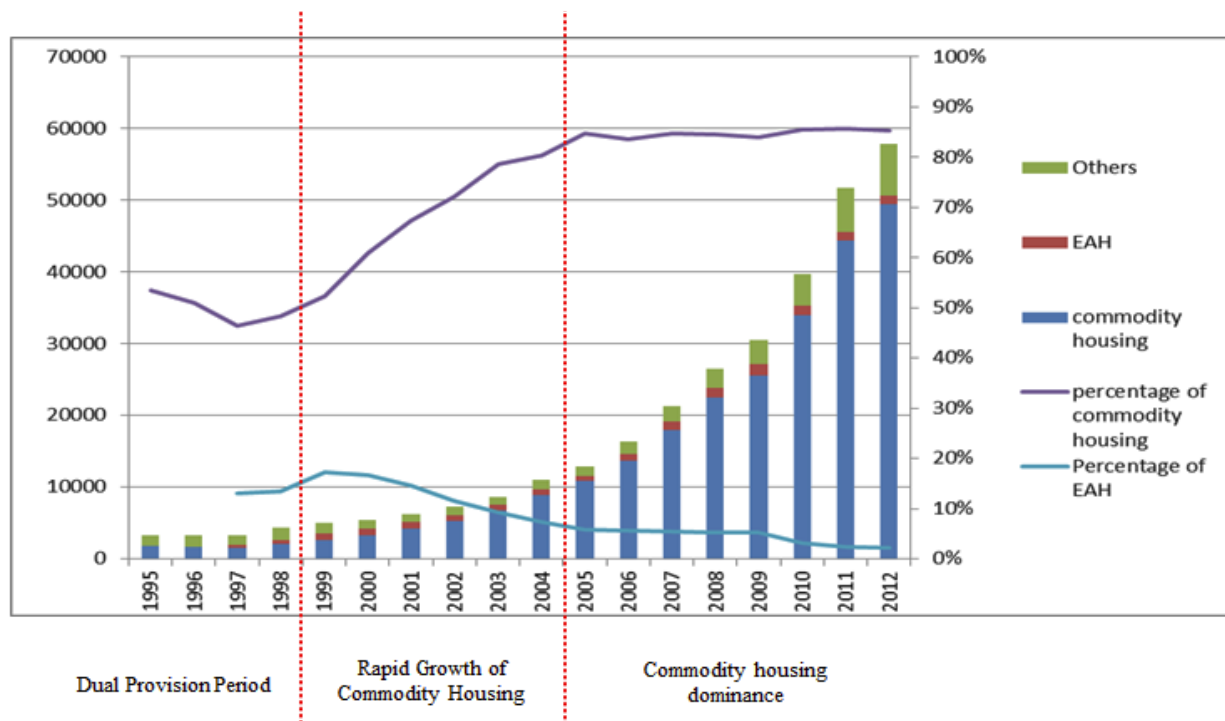
The slow progress of reform in the welfare housing system resulted in enormous financial pressure on government. A document issued in July 1998, “Directive 23” (The State Council, 1998), marked a real housing market boom which was fuelled by growing land market and real estate investment (Man, J. Y.; Zheng, S. & Ren, R. 2011). In addition to the support for land in the market and with mortgages premier Rongji Zhu also identified two main directions for in-kind housing reform: 1) to end the work unit housing provision system, and 2) to rapidly transfer ownership of remaining public housing to private individuals. By this time, a completely market-oriented housing provision system had been formally shaped.

**End of work unit-based housing provision.** The acceleration in public housing in 1998 resulted in the entire withdrawal of work units from in-kind housing provision. Instead, cash subsidies for employees to purchase market housing replaced the invisible subsidy for in-kind housing. The amount of the subsidy depended on monthly income, seniority and official rank of employees (Wang & Murie, 2000). This replaced in-kind housing provision with government

aid with market housing provision. At the same time, The State Council sketched the ideal structure for housing provision (Renaud, 2004):

- High income households (about 10–15%) purchase or rent commodity housing in the market
- Low- and middle-income households (about 70–80%) purchase or rent economically affordable housing provided by government
- Lowest income households (about 10–15%) given access to low-rent housing provided by government

By the end of the 1990s, the housing tenure structure was comprised of 36% commodity housing, 30% transferred public housing and 34% public housing (this is a rough estimation rather than an exact one, owing to the lack of statistical data). These data demonstrated that owner-occupied housing increased to nearly 70% after the evolution of in-kind housing based on work units. In addition, the importance of commodity housing is reflected in the investments in it and in economically affordable housing (EAH) in the welfare system (see Fig. 3.6): the percentage of commodity housing increased steadily after 1998 to nearly 85% by 2004 and stayed constant at this level in the aftermath.



**Fig. 3.6 The structure of housing investment in urban China, 1995–2012 (Unit: 1000 yuan)**

Note: EAH is the abbreviation for economically affordable housing. It is one type of social housing with welfare attributes. Our study will be explained in Chapter 4. Here we draw mainly on the data on commodity housing to demonstrate its dominant role in the housing structure. Source: Deng, Hoekstra, & Elsinga, 2004: p. 10.

**Overall housing commercialization.** In addition to the work unit withdrawing from its function in housing provision, the state also made great efforts in improving the housing market through prioritized policies on land provision and funding. The positive influence of political support on land leasing was demonstrated in the notable increase of areas for and expenditure on purchased land in the real estate market. Tab. 3.6 demonstrates that purchased land space rose from 66.42 million m<sup>2</sup> to 101.10 million m<sup>2</sup> in one year during 1997–1998, at an increased rate of 52.2%. This upward trend remained at a remarkably persistent level until 2004. The amount of purchased land after 2004 fluctuated, but the land space to be developed showed an overall growth trend and stayed at a stable level after 2010. Nevertheless, expenditure on purchasing land showed sustainable growth. The increase in expenditure was particularly significant after 2009.

Furthermore, government planned favourable policies for a housing provident fund (HPT) and bank mortgages to guarantee funds to enable residents to purchase housing, and accordingly motivated expectations towards commodity housing. With the aim of formulating demand-derived consumption during the housing commercialization process, individual purchasers were encouraged to apply for loans on commodity housing. Additional to urban residents' accessibility to mortgages provided by banks, government also introduced a HPT, to ensure greater affordability of commodity housing. In the aftermath of 1997, domestic mortgages in real estate maintained a steady upward trend (see Fig. 3.7). Domestic loans increased from 105.31 billion in 1998 to 2124.26 billion in 2014. The increase in self-raised funds and other funds was considerable. By 2014, funds collected by these two ways had increased from 116.7 to 5041.98 billion and from 181.19 to 4968.98 billion, respectively.

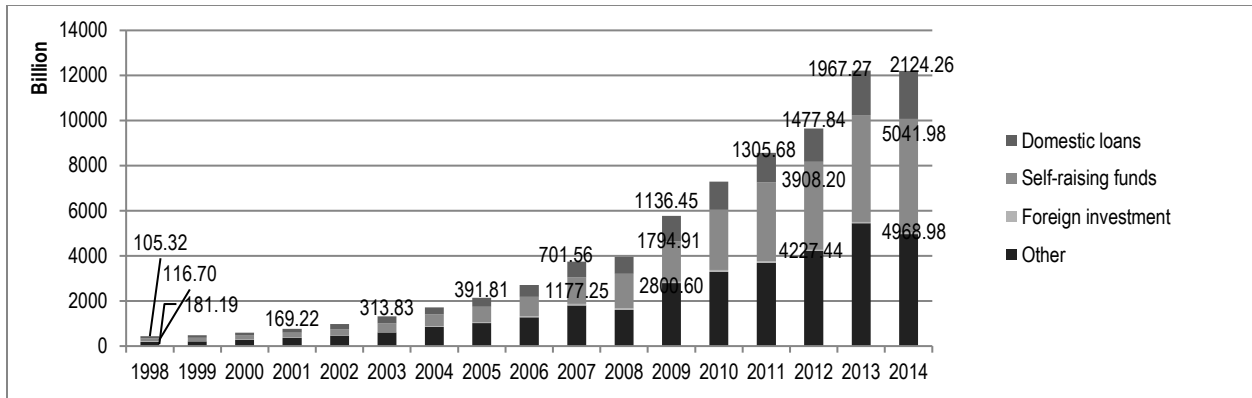
After 1998 the housing commercialization processed notably. Real estate development was reflected in the rapid increase in floor space and the number of residential dwellings (see Fig. 3.8). However, lack of regulation on land development resulted in the emergence of serious illegal land use and transition for profitable purposes. In order to prevent speculation, government structured a land management system and set standard procedures for land transition. Firstly, all for-profit land use had to be traded by legal bids or auctions rather than by informal agreements and any transition behaviour was required be registered in the official land system. Secondly, housing transition was also standardized. Housing purchases/sales for speculation were forbidden, and if sold in the first two years after purchase business tax had to be paid to government (Deng et al., 2004).

**Tab. 3.6 Land development in real estate market, China**

Year	Items	Purchased land space (10,000 sq.m)	Land space to be developed (10,000 sq.m)		Expenditure in purchasing land (Million)
			Increasing rate		
1997		6,641.70	/	17,676.10	/
1998		10,109.30	52.2%	13,532.70	37,540
1999		11,958.90	18.3%	13,505.20	50,000
2000		16,905.24	41.4%	14,754.77	73,399
2001		23,408.99	38.5%	14,582.13	103,877
2002		31,356.78	34.0%	19,178.65	144,581
2003		35,696.48	13.8%	21,782.58	205,517
2004		39,784.66	11.5%	39,635.30	257,447
2005		38,253.73	-3.8%	27,522.00	290,437
2006		36,573.57	-4.4%	37,523.65	381,449
2007		40,245.85	10.0%	41,483.97	487,325
2008		39,353.43	-2.2%	48,161.07	599,562
2009		31,909.45	-18.9%	32,816.54	602,371
2010		39,953.10	25.2%	31,457.95	999,992
2011		44,327.44	10.9%	40,220.76	1,152,725
2012		35,666.80	-19.5%	40,195.99	1,210,015
2013		38,814.38	8.8%	42,280.47	1,350,173
2014		33,383.03	-14.0%	42,136.28	1,745,853

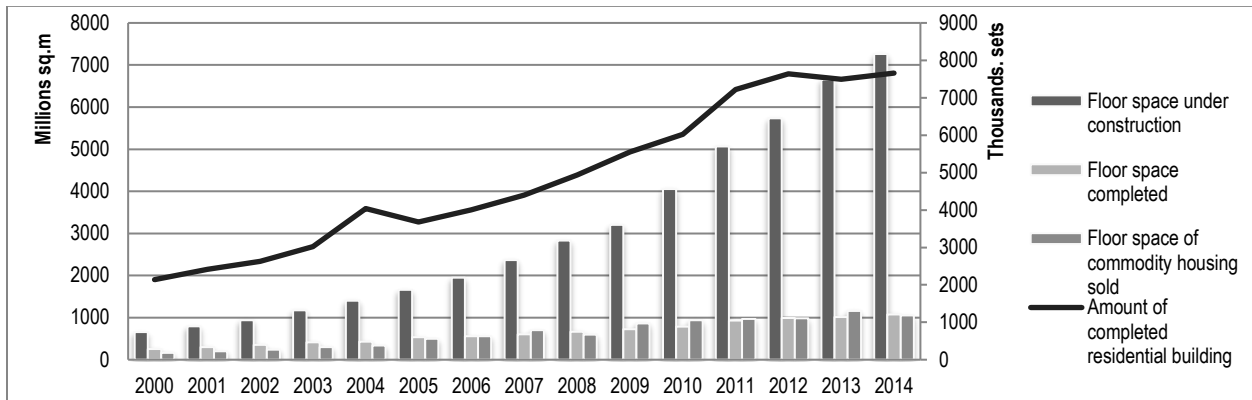
Note: Lack of data on "Land space to be developed" and "Expenditure in purchasing land" from 1997-1999.

Source: own draft 2016, according to National Statistical Yearbooks 1999-2007, Tab. 6-38 to Tab. 6-42: Land development and purchase of enterprises for real estate development; National Statistical Yearbooks 2008-2012, Tab. 5-30: Land development and purchase of enterprises for real estate development; National Statistical Yearbooks 2014-2015, Tab. 15-3: Land development and purchase of enterprises for real estate development.



**Fig. 3.7 Fund resources for real estate development, China**

Source: own draft 2016, according to National Statistical Yearbooks 1999-2007, Tab. 6-27 to Tab. 6-39: Main indicators of real estate development; National Statistical Yearbooks 2008-2012, Tab. 5-27 & Tab. 5-29: Main indicators of real estate development; National Statistical Yearbooks 2014-2015, Tab. 15-1: Main indicators of real estate development.



**Fig. 3.8 Real estate development, China**

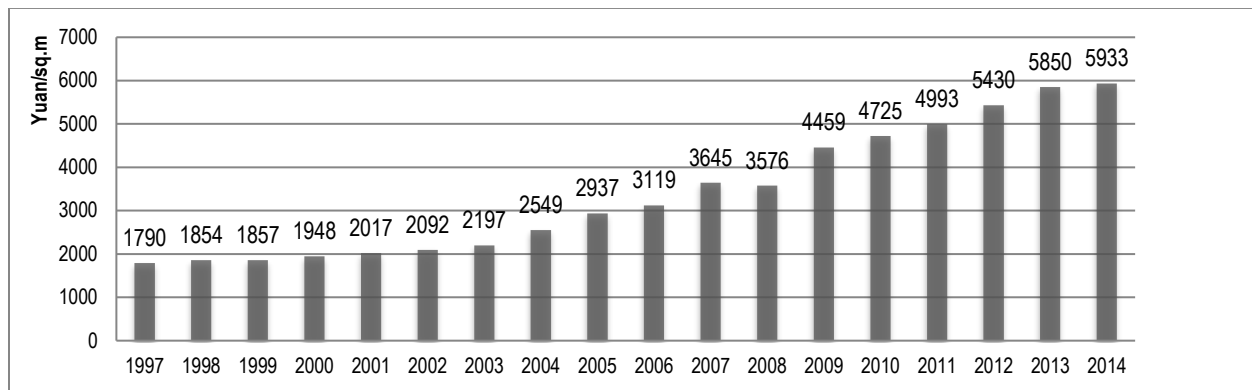
Source: own draft 2016, according to National Statistical Yearbooks 1999-2007, Tab. 6-27 to Tab. 6-39: Main indicators of real estate development; National Statistical Yearbooks 2008-2012, Tab. 5-27 & Tab. 5-29: Main indicators of real estate development; National Statistical Yearbooks 2014-2015, Tab. 15-1: Main indicators of real estate development.

**Introducing the social housing system.** Problems with unaffordability widely existed, particularly among people with low incomes. Limited incomes and real estate development both widened the gap between affordability and housing prices. Firstly, rapid real estate development has resulted in a great upsurge in the commodity housing price. This trend brought heavy pressure on citizens when buying a house in the market. With overall policy support, real estate soon became one of the crucial forces in economic growth, and leasing land to developers in the market became an important channel for local government revenue. At the same time, speculation behaviour emerged widely at an amazing speed at this time. However, the great benefits and importance of rapid real estate development resulted in local governments being hesitant to confront and address the lack of affordability of housing. These on and off policies toward the housing price resulted in housing price inflation. Since 2000, the housing price has increased rapidly with the average rate increasing at almost 8.5% each year. By the end of 2014, the housing price at national level had reached over three times the price in 2000 (Fig. 3.9), and this situation was even more significant in metropolises like Beijing and Guangzhou. Some researchers have measured the price-to-income ratio<sup>6</sup> and housing affordability index<sup>7</sup> of this

<sup>6</sup> Price-to-income ratio (PIR) compares the median house price to the median household income. The UN-HABITAT regards a ratio of 3:5 as a normal ratio. A higher value means greater difficulty in purchasing housing (Man, Zheng and Ren, 2011).

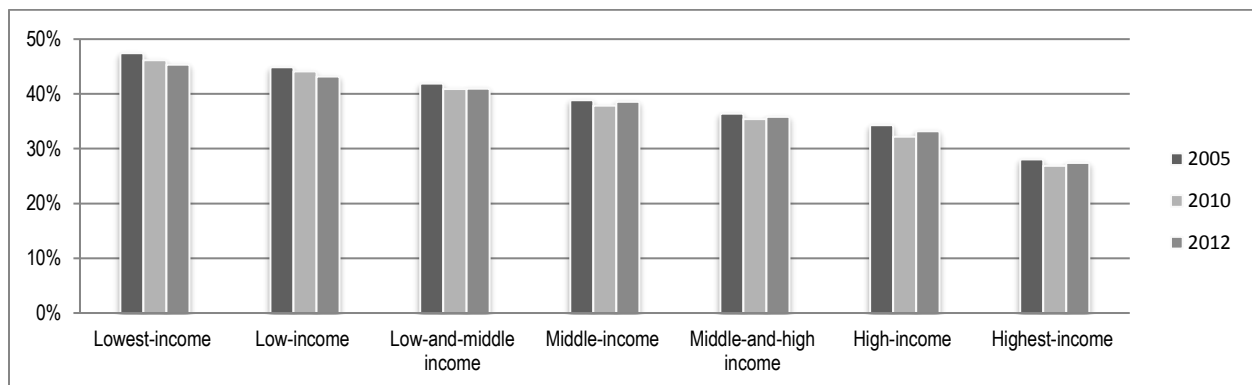
<sup>7</sup> The housing affordability index (HAI) contains monthly data from the National Association of Realtors of America since 1981. HAI sets 20% of house price as down payment and 25% of gross monthly income as maximum mortgage. An index value of 100 indicates that a median-income family has sufficient income to purchase median-priced housing. A higher value implies that more households have the ability to afford to pay for housing (Man, Zheng and Ren, 2011).

period, Man, Zheng and Ren (2011) calculated data for 265 cities in China and demonstrated that 184 (69.4%) cities suffer from severe unaffordability problems and residents in 63.3% of cities have insufficient income to purchase ordinary commodity housing. Secondly, weak economic ability made it difficult for low-income groups to obtain housing via the market mechanisms in cities. As shown in Fig. 3.10, housing consumption took up a high percentage of total living expenses of residents at the low-income level. Residents with lower income used a greater percentage of their income for renting or buying houses than residents with higher income. Nearly 45% of lowest-income residents' expenditure was on housing, while the percentage of those with higher income was only around 26%. This illustrates that low-income residents bear a severe burden in housing consumption.



**Fig. 3.9 Selling price of commodity housing since 1997, China**

Source: own draft 2016, according to National Statistical Yearbooks 1999-2007, Tab. 6-27 to Tab. 6-39: Main indicators of real estate development; National Statistical Yearbooks 2008-2012, Tab. 5-27 & Tab. 5-29: Main indicators of real estate development; National Statistical Yearbooks 2014-2015, Tab. 15-1: Main indicators of real estate development.



**Fig. 3.10 Ratio of housing expenses of urban residents to living expenses, by income levels, China**

Source: own draft 2016, according to National Statistical Yearbooks 2006 & 2013, Tab. 10-7: Per capita annual living expenditure of urban households; National Statistical Yearbooks 2011, Tab. 10-8: Per capita annual living expenditure of urban households.

With respect to difficulties in purchasing commodity housing in the free market owing to income levels, government launched a new welfare housing system (social housing system) as a supplementary to the real estate market. The social housing model started in 1994 when the state suggested local government providing material housing stocks to local low-income residents. Social housing was constructed and allocated with subsidies from local government and mainly targeted low- and middle income families to enable favourable housing. The project was built in terms of local situation and referred to by different names (ANJU & JIEKUN housing in Guangzhou; economically affordable housing in Beijing). According to this model, local government provided land parcels, employed housing developers and sold completed houses to qualifying families at a discount (around half the price of commodity housing). The qualifying households only held part ownership, and reselling or transferring them in the market was forbidden. In 1998, the state issued some new policies and formally defined the economical affordable housing and the low-rent housing. Local lowest- and low-income families had access to low-rent housing, and middle- and low-income families could buy economically affordable housing in at subsidized price. In 2008, government additionally drew up a plan for the price-

capped housing (also named as Shangxian Fang or Xianjia Fang) in order to meet the demands of local middle-income households.

However, the housing demands of urban migrants were still excluded by the model. Then, another policy proposed the introduction of public-rental housing (*Gongzu Fang*) with increased guarantee range to migrants who had fixed jobs. Up to now, a multilevel social housing model had basically formed. At national level, the percentage of guaranteed housing reached 2.9%. The introduction of the social housing model relieved housing pressure on the part of urban residents to some extent, but lack of rational regulation resulted in a number of speculation behaviours which betrayed its original purpose. Government gradually increased regulation over housing and standardized the qualification procedure.

### 3.3.2 The structure of market-dominated housing provision

#### 3.3.2.1 Actor network in the market-dominated housing system

Developing the real estate market and establishing a social housing system have improved ways to obtain houses. Now those seeking housing may either trade in the free market or apply for social housing in the governmental system. Income is a main factor in determining the housing choices of urban residents. In this multilevel housing provision system, commodity housing is the dominant type controlled by real estate developers to meet the housing demands of over 90% of urban residents, and social housing is the supplemental type led by government. The following section draws on the roles of different actors in this system (see Fig. 3.11).

#### Actors' role

- The state: master policymaker

In the market-dominated housing provision system where demand-led housing provision has been established, the state is no longer deeply involved in housing affairs. Details of investment, land provision, housing construction and allocation have decentralized to local administrative actors. Therefore, the central government only takes charge of sketching master policies to direct housing structure and development. In housing commercialization after 1998, the state drew up plans to end in-kind housing, thus privatizing housing ownership, encouraging market provision and establishing social housing system. These policies determine the basic housing provision structure and influence the position of other actors in system.

- Real estate developers: dominant provider

The development of demand-led housing consumption is characterized by the withdrawal of interventions by government and work units and the now central role of the real estate market in housing supply. Companies in the real estate market have been granted the right to dispose of land parcels that are attained by way of bids or auctions from local government. These companies are able to manufacture commodity buildings and sell them to potential purchasers in the free market. By 2010, the proportion of investment on commodity housing had grown from 48.4% in 1998 to 75.6%, and maintain a slow upward trend to 79.8% in 2014 (National Statistical Yearbooks, 1999-2015: Total investment in fixed assets and in residential buildings in the whole country).

- Local government: manager and housing provider

The main actors in housing provision are locally based. Subordinate sectors of central government, i.e. local ministries, take full charge of the administrative area. On the one hand, local government can make specific policies in line with the direction of the state in relation to local circumstances. It is possible to design land leasing procedures and to define prices, and to conduct the development rate of the local real estate market and social housing system. Since measures are applied independently in different cities, local government becomes the unique manager of the housing system in an administrative area. On the other hand, housing unaffordability among middle- and low-income families contributes to important role of local government in social housing provision. Because of the revenue was used to finance social housing construction and to subsidize urban residents, in this sense, local government is also a secondary housing provider in comparison with the real estate market.

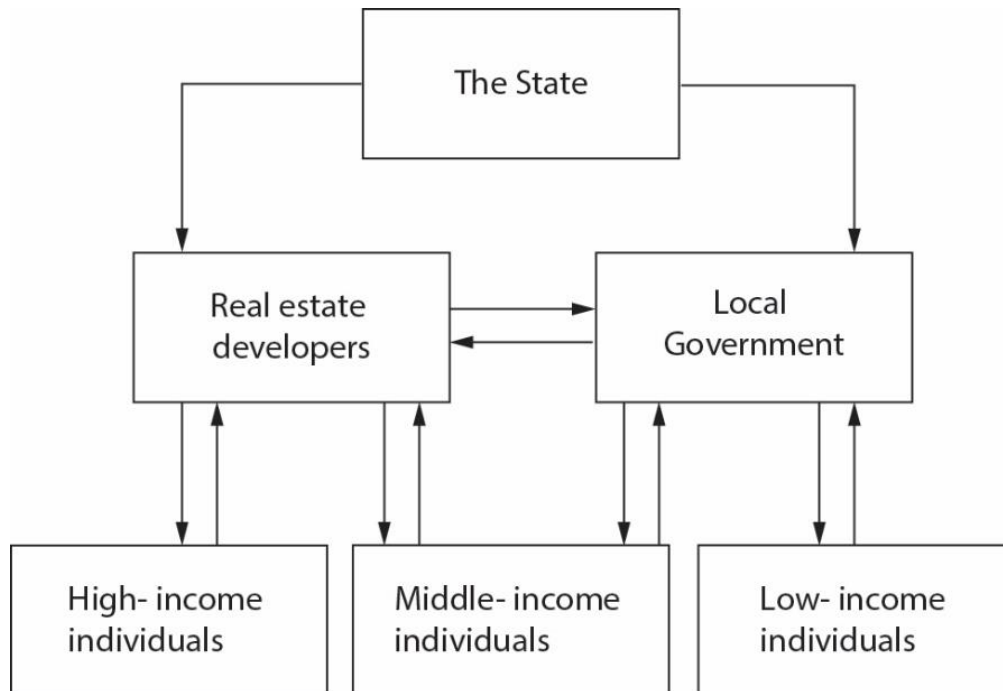


Fig. 3.11 Actor network in the market-dominated multilevel housing system in China, since 1998

Source: Own draft, 2016.

- Residents: purchaser

After the reform of 1998, residents have to use their own income to purchase commodity housing in the free market, which is different from the previous way of accessing public housing with subsidies from government and work units. Apart from the purchase of transformed housing from work units at the end of the 1990s, buying commodity housing became the dominant way to obtain a house. Most urban residents can apply for a mortgage from banks or use a housing provident fund. Residents with lower incomes are allowed to purchase or to rent social housing from local government.

**Interactions between actors.** There are three main interactions among the actors involved in the housing provision system. Firstly, in the governmental system, the actors at national level and those at city level represent management. Central government does not control the behaviour of real estate developers but assigns local government to operate in the local housing market. Giving this right to local administrators strengthens the association between actors at city level. The second interaction happens between local government and developers in the real estate market. The relationship tends to function as a cooperative one rather than a supervisory one. Certainly, as an administrative sector, local government still has the ability to lead the running of the real estate market. The relationship is indirect management, which is fulfilled by making the rules attached to lease land parcels or by adjusting the tax rate. Local government provides land parcels to real estate companies through market transactions, and the land leasing fee is in turn importance income for city government. Even in the social housing model, such cooperation is close as local government employs qualified companies to build housing stocks on land parcels reserved for social housing. The above behaviours indicate that operations between administrative actor and developers at local level entail marketing businesses and reciprocal trades. Finally, the interaction between housing providers and those who are benefited occurs in three ways. According to the income level, residents with higher income obtain housings via the market mechanism. Middle-income individuals can purchase or rent commodity housing or consider certain types of social housing (e.g. economically affordable housing, and price-capped housing) with subsidies from local government. Then, lowest- and low-income people have a chance to obtain social housing stock such as low-rent housing or public housing.



### 3.3.2.2 Housing tenure structure

Under the housing commercialization process, the percentage of private ownership has grown greatly. When housing allocation is dominated by market mechanisms, individual income and occupation have a great influence on the residential outcomes of urban residents. The current housing system comprises different types of housing: commodity housing, privatized public housing, and social housing (i.e. low-rent housing, economically affordable housing, public-rental housing, and price-capped housing). Urban residents of different occupations and incomes can choose the matching house type. This multilevel housing structure contributes to the formation of diversified housing choices (see Tab. 3.7).

**Tab. 3.7 Housing tenure structure in market-dominant multi-level housing system, since 1998**

	Social groups	Tenure type		Housing type	Ownership
Urban residents in	Cadres, skilled workers	Buy	With subsidy from government	Transferred public housing	Private
	Normal employees	Buy	With subsidy from government	Transferred public housing	Private
	Low-income employees	Rent	With subsidy from government	Public housing	Public
Urban residents in different income	High-income individuals	Buy / rent	In free market	Commodity housing	Private
		Buy / rent	In free market	Commodity housing	Private
	Middle-income individuals	Buy	With government's subsidy	Price-capped housing	Private Partial ownership
				Economic affordable housing	
Low-income individuals	Rent	With government's subsidy	Low-rent housing/ public rental housing	Public	
Urban migrants in different income or job	High-income migrants	Buy / rent	In free market	Commodity housing	Private
		Buy / rent	In free market	Commodity housing	Private
	Middle- and low-income migrants with stable job	Rent	With government's subsidy	Public rental housing	Public
		Rent	With subsidy from employers	Dormitory/ apartment	Employers
	Middle- and low-income migrants with temporary job	Rent	In free market	Commodity housing	Private
		Rent	With subsidy from employers	Dormitory/ apartment	Employers

Source: own draft, 2016. Database: Guangzhou Land Resource and Planning Bureau, 2013.

Since the 1990s, the process of selling public housing to private individuals has greatly increased the rate of private ownership. At the same time, the increasing role of the real estate market had pushed the formation of a new housing tenure structure. The status and turnover of the collective or personal contributions were no longer determinant factors for housing differences. Prioritising some workers (e.g. cadres, skilled employees, person with longer work age) in choosing dwellings with better quality and favourable location has been eliminated. However, the influence of this allocative principle have lasted to some extent. The privatization of public housing mainly obeys the rule of selling houses to the original residents. As the consequence, those advantaged employees in government have achieved better housing than normal workers. Small numbers of employees in special difficulty and with low-income who cannot purchase reformed housing, are allowed to rent the remaining public housing at a low price.

In the housing market, income level plays major factor in causing housing differences. Higher income means stronger purchasing power, which allows urban residents to access better dwellings than others, and the converse is also true. Most people with certain income have or attempt to purchase dwellings in the housing market. Differences among them would be the quality, area, location or management of residences. In addition, government also carried out social housing projects to complement urban living systems. Accordingly, economically affordable housing and price-capped housing aim to improve housing ownership among middle-income people, and low-rent housing and public rental housing aim to guarantee basic the housing needs of local low-income families. To address the gap between housing

price and affordability of middle-income people, local government takes measures to control land costs, setting upper limits of the selling price, and subsidizing people who qualify to purchase economically affordable housing. In addition, the housing difficulties of low-income groups are solved through monetary subsidies and in-kind subsidies (which means the housing stocks like low-rent housing and public-rental housing).

Nevertheless, the housing tenure structure of urban migrants demonstrates a specific issue. Apart from some talented or high-income migrants, the majority of migrant workers from peripheral or rural areas have severe housing difficulties. Although allowed to purchase commodity housing, their jobs in factories and small-scale service firms limit their income. Weak affordability and none of local registers, they are mostly excluded from both the real estate market and the local social housing system. Renting low price dormitories is the major way of obtaining shelter. After 2010, the government started public-rental housing projects which target migrants with fixed jobs and with a certain period of residence.

### **3.3.3 Implications of housing commercialization and privatization**

Housing reform achieved great success in several aspects. Firstly, the residential conditions of most urban residents improved significantly. The housing market provides houses of various standards, and demands related to size, location and other conditions can be mostly fulfilled in accordance with personal economic ability. In comparison to the previous housing system, in which all members only had access to ordinary and even poor residences, this demand-led mechanism resulted in differences in housing consumption. Increased wealth among private individuals greatly drove the housing system. No doubt that this demand-led system has increased the rate of private ownership, and has improved living conditions. Secondly, the reform was successful in opening various channels of housing provision, enabling residents in various situations to access housing resources. Despite the above achievements, we cannot ignore the increased problems of residential stratification and spatial fragmentation in urban areas.

From a social perspective, housing reform has led to residential diversification among urban residents. The process that has taken place since 1998 was not only one of deconstruction and rebuilding but also one of adjustment. It is deeply rooted in traditional systems, which have social and spatial implication and sustain the gap between the rich and the poor (Wang & Murie, 2000). Housing privatization freezes the gap in housing conditions between employees with higher status and normal employees. Simultaneously, housing commercialization deepens the gap between people with higher income and those with lower income. In sum, the homes of urban residents have been differentiated along the income and social status lines. In particular, high-income residents enjoy better housing than lower-income residents.

This housing stratification is more complicated from a spatial perspective. Both the work unit-based location of previous system and the land value-based location of the current system have an impact on spatial division in urban areas. As we know, work unit employees tend to live in the original public housing which is spatially located near to the workplace. The different locations of work units may result in the spatial separation of residences by previous workplaces. Subsequently, a greater influence has been the commercialization of land and housing. Urbanization indirectly attributes different values to land parcels. Land parcels with better locations (e.g. near the city centre) possess higher values, and parcels located in secondary locations (e.g. periphery area) tend to have lower value. The price of land parcels also greatly determines the price of houses built on them. A house that is located in a central location, with sufficient infrastructure may be much more expensive. Simultaneously, development of a social housing model also greatly affects the location of low-income residents with a large number of them residing in communities that are distant from the city centre. Therefore, high-income people obtain housing in better developed areas, while low-income residents tend to live in more inconvenient locations.

## **3.4 Conclusion**

The development of housing system in China from 1949 may be regarded as a gradual process including the advancement of the real estate market and the withdrawal of governmental control. With regard to the roles of the main actors and housing provision structure, our study has divided this process into three phases: the socialist housing system 1949–1978, the dual-track housing system 1979–1998, and the market-dominant system after 1998. In the first

phase, the dominant housing provider in urban areas was the work units, which allocated residences to employees. At this time, the public housing constructed was the dormitory type, which fulfilled only basic living conditions. The residential environment was commonly simple and poor. This was followed by the second phase, in which the housing market flourished. Housing reform in 1979 launched the possibility of commodity housing provision by the real estate market, and public housing started to be transferred into private ownership. 1979–1998 was a transition period during which both tracks of public housing provision and commodity housing provision were functioning. With the support of policy and funding, the increase in investment in the housing market, the increase in commodity housing and the increase in privately occupied housing grew steadily. By 1998, public housing provision had stopped. Most public housing of good quality was sold to private individuals in low prices, with only a few being kept by government to meet the housing needs of low-income families. The percentage of private ownership reached over 72% and is still growing (Wu, 2015). Citizens were encouraged to purchase commodity housing by themselves. During this time, original state-owned welfare housing was privatized and commercial housing had become the mainstay of the housing supply system (Wang & Murie, 2011). The real estate market is becoming complete and has subsequently developed greatly.

To sum up, the end of public housing provision in 1998 signalled a turning point in the Chinese housing system (Wu, 2012). The rapid transformation was manifested in the changes of functions of the main actors. The role of work units has changed from involvement to total withdrawal, and the real estate market has developed from very limited to overall dominant. In particular, the role of government has transformed from direct control to indirect intervention, the involvement of central government has declined and local government has relinquished control of the housing market.

However, flaws in the market-oriented supply system soon appeared with soaring house prices and a turbulent real estate market which resulted in difficulties in accessing housing for middle- and low-income families. To address this issue, government strengthened its administrative powers in the housing system by establishing out a series of social housing projects from 1994. Especially after 2003, housing policies changed direction to attain housing equity by implementing strategies from two sides: stabilizing house prices, and accelerating social housing construction. Some people have suggested that the social housing system has positively contributed to stabilizing the course of housing marketization (Ye, 2010). This measure not only aimed at addressing the housing difficulties of low-income families, but also adapting the high prices of market housing. Up to now, the market-oriented multi-supply housing system of China has basically formed, and the social housing system plays a significant role in meeting the demands of the urban poor. The social housing system covers all local low-income households, so large-scale social housing communities built in suburban areas have spatially fixed local low-income people who was living in the old city. Several middle-income people have moved to these communities as well. This measure reorganized spatial patterns, particularly among low-income people with local registers, which has resulted in spatial segregation between the rich and the poor. In next chapter, we take Guangzhou as the case city in order to identify the detailed operation and implications of the local social housing models.

## 4 The social housing system in Guangzhou

Because of negative effects of deficient management on the market-centred housing system, the price of market housing has increased radically. This trend has led to a strong demand for habitable housing among weaker groups in cities. The phenomenon is specifically pressing in metropolises in China, like Guangzhou, whose housing allocation relies on people's economic abilities in relation to occupation and education (Zhou, 2006). Differences in affordability contribute to residential hierarchy in terms of location, housing quality and social network. The economically driven principles are also displayed in the allocation of urban land and residential spaces. Land parcels that is more suitable to local development are costly. Consequently, the organization of city space is liable to reconfigure certain separated, peripheral areas for non-beneficial uses. The commonly discussed issues of urban poverty, such as fragmentation, pauperization, residential segregation and cultural exclusion, refer to spatial patterns and involve excluded people. We have noticed that housing is not only an issue that depends on demographic features, but also links to the institutional system. Particularly, social housing is a model controlled by administrative power, policy structure and institutional operation which may determine its socio-spatial development. Therefore, it is worthwhile clarifying the political backdrop and operative mechanism behind the running of this system.

Because the structure of Chinese social housing provision hasn't been very clear in the West, this study aims to explain the housing types, actors and interactions, locating principles and distribution rules of Guangzhou social housing model in this chapter. The content consists of the following topics: firstly, to identify four types of social housing in terms of definition, goal, targeted group and achieved outcomes. Secondly, to seek how the provision structure formed and how the actors involved interact. Finally, to elaborate the content and impact of the key principles that have been applied to the land reservation, housing allocation and location design process. Our study attempts to depict an overall view of the policy model for Guangzhou's social housing project in terms of these three aspects. This will be helpful in identifying efficient actors and institutional actions, and furthermore, identifying the implications of possible improvements to the recent system. The analysis rests mainly on a qualitative method to depict government functions.

### 4.1 Housing types: definitions and targeted groups

Policy supporting an urban social housing project is executed in two ways: monetary subsidy and in-kind subsidy. Commonly, social housing in China refers to in-kind subsidy, which is developed by local government by providing real housing stocks to targeted groups. Local government's responsibility in this regard includes providing land parcels, investing in construction, identifying the insured population, and later, management of the housing. This city-based operation differs between cities with regard to detailed policies and regulations in relation to housing prices and the range of the qualifying population. Our case city, Guangzhou, has developed six types of social housing: JIEKUN housing, ANJU housing, low-rent housing (LRH), economically affordable housing (EAH), public-rental housing (PRH) and price-capped housing (PCH).

Up to now, the policy framework in Guangzhou has proposed six types of social housing. The first two types represent the early form of economically affordable housing which was proposed around the 1990s. The purpose of developing JIEKUN housing during 1986–1994 and ANJU housing during 1995–1997, as to address the housing difficulties resulting from decentralization. The two forms of housing functioned for a short time only and were soon included in the social housing model at the beginning of the 21st century. Because of very limited quantities and ownership transfer, the two forms of housing retain a few features of social housing. In comparison to the later developed four types, their effects as social housing are quite small. In this section, our attention is focused mainly draw on LRH, EAH, PRH and PCH, which were launched along with the official proposal of the social housing model after 2004. The explanation in following part includes the definition and connotation of these four types of housing.

### 4.1.1 Economically affordable housing (EAH), 1993–2013

#### First proposal of EAH in 1993:

To accelerate affordable housing construction by raising funds or through collaboration.

**In:** National policy, 'To Strengthen Master Control of Real Estate Market and to Promote Sustainable Development of Real Estate Industry', Aug 1993.

#### Definition 1:

EAH refers to policy-related welfare housing that is built with restrictions on dwelling area and selling price. It is developing with government support in terms of investment and construction, and aims to resolve the housing difficulties of low-income urban families.

**In:** National policy 1, 'Administrative measure of affordable housing', May 2004. National policy 2, 'The Implement Methods of Targeted Central Nation's Subsidies on Low-Rent Housing', No. 57, Oct 2007.

#### Definition 2:

EAH refers to policy-related welfare housing that is built with restrictions on dwelling area and selling price. Meanwhile, government and insured residents simultaneously have ownership of EAH. Beneficiaries only possess part of EAH property.

**In:** Policy of Guangzhou city, 'The Implement on Economic Affordable Housing Policy', No. 48, Dec 2007.

#### Box. 4.1 Definitions of economically affordable housing (EAH)

Source: Guangzhou Bureau of Land resource and housing, January 2013.

EAH is the first form that was officially proposed in the social housing model after the end of public housing provision in 1998. Along with the acceleration of the privatization of public housing, housing stocks of poor quality were demolished. Because of lack of access to subsidized houses and, often, insufficient purchase ability in market, the issue a housing shortage among local low-income people greatly emerged. For the purpose of resolving settlement pressure, the state firstly proposed the idea of EAH in 1993, and then officially modelled the concept in the policies that were enacted in the second year (The State Council, 1994; The Constructive Ministry, 1994).

The State Council then suggested developing ANJU project to address basic living demands (The State Council, 1995). This time, the housing with a welfare function was called economically affordable housing (EAH). The first turn of EAH in Guangzhou was represented by ANJU housing and JIEKUN housing which were established in 1998. These two kinds of housing acted as a temporary solution for the severe housing demands that could not be fulfilled by the market, particularly among the lowest-income families. By using collective funds from national government and local authorities, a numbers of uniform, small-size dwellings, with private kitchens and toilets were built in line with the construction standards of the local ministry. Three typical projects, Yunyuan, Datang and Tongde, addressed the housing difficulties of a small number of local low-income families. However, government only sold part of ownership to residents, which meant that any private trade in the market were forbidden for the first 10 years after purchase. If residents wanted to sell their houses in the market, they were required to pay additional costs to local government. In addition, it was possible to sell them back to government which redistributed them to needy families (Wang & Murie, 2011). However, more attention was paid this time to the commercial housing which has high return, and thus the non-profit attributes of the ANJU project meant the process stopped very soon.

The second turn of EAH construction started in 2004. In line with with the definition proposed by the state in 2004 and 2007 (see Box.4.1), the Guangzhou ministry formally identified the concept and connotation of EAH in terms of the local situation. This formal model was restricted to a defined targeted group, and included an application process, allocation principles and management. Both national and local government provided finance for the EAH project in Guangzhou city. And, local government provided land parcels for housing construction. These settlements should be built according to administrative constraints. For instance, the policy issued in 2007 pointed out that EAH is a economic housing type, whose living area should be less than 60 m<sup>2</sup> (The State Council, 2007). Those low- and middle-income families whose income level is lower than the upper limit or per capita living space is below the defined standard (the upper limit is changeable with the time going, taking references to the standards of 2012 in Tab. 4.2) qualify to apply for EAH. Owing to the small number of houses, lowest-income households have prioritised access to them. the qualifying residents can purchase part of ownership at a much lower price than in market system. That is to say, any transformation of EAH for profit or individual purposes is totally prevented. Passing the entire ownership from government to residents takes five years; afterwards, private owners have the legal right to sell their houses without intervention from local government. At city level in Guangzhou, construction of EAH stopped in 2013, and government turned to instead developing a PRH-centred provision structure (The Guangzhou Office of housing security, 2013).

### 4.1.2 Low-rent housing (LRH), 1998-now

#### First proposal of LRH in 1998:

Apart from transforming vacant public housing owned by government and work units into LRH using, it is also possible to establish new housing blocks with government support in terms of policy and finance

**In:** National policy, 'The Notice about Further Deepening Reform of Housing Institution and Accelerating Housing Construction', No. 23, Jul 1998.

#### Definition 1:

LRH refers to dwellings invested in and built by city government. The state and local administration are both give support in terms of land, finance and later management. Local government is responsible for defining entry standards for local LRH system.

**In:** National policy, 'The management on Urban Low-Rent Housing', No. 70, Apr 1999.

#### Definition 2:

The LRH system is the main type of social housing model for addressing the housing difficulties of low-income families. Meanwhile, local ministries should extend the coverage of LRH from the lowest-income families to low-income families.

**In:** National policy, 'Several Opinions about solving Housing Difficulties of Urban Low-Income Families', No. 24, Aug 2007.

#### Definition 3:

LRH system refers to a housing security institution operated by government by way of monetary subsidy, in-kind subsidy and rent reduction, which aims to address the housing problems of low-income families.

**In:** Policy of Guangzhou city, 'The Implement of Low-Rent Housing Policy', No. 48, Dec 2007.

#### Modification 1:

To adjust the upper limit of annual disposable income from 7680 RMB to 9600 RMB.

**In:** Policy of Guangzhou city, 'The Notice about Adjusting Application Criteria of Low-Rent Housing', No. 63, May 2010.

#### Modification 2:

To adjust the upper limit of annual disposable income from 9600 RMB (800 RMB monthly) to 15600 RMB (1300 RMB monthly).

**In:** Policy of Guangzhou city, 'The Notice about Improving Upper Limit on Income of Low-rent Housing', No. 124, Aug 2012.

#### Modification 3:

To adjust the upper limit of annual disposable income from 15600 RMB (1300 RMB monthly) to 22600 RMB (1883 RMB monthly).

**In:** Policy of Guangzhou city, 'The Notice about Improving Upper Limit on Income of Low-rent Housing', Sep 2015.

#### Box. 4.2 Definitions of low-rent housing (LRH)

Source: Guangzhou Bureau of Land resource and housing, January 2013.

The State Council first proposed the concept of low-rent housing (LRH) in Document No. 23 of 1998. The issue of this policy marked the beginning of new housing model. Three key decisions led to the forming of a new housing provision structure. 1) To make market mechanisms the dominant force in housing provision, to replace the work unit-based housing provision completely. 2) A welfare housing system suggests developing an EAH-dominant structure, which acts as an addition solution in the housing market system. 3) To establish LRH to meet the needs of lowest-income households. It is notable that the basic form of social housing system was modelled and its role in the entire housing system was clarified. The following year, the national ministry involved issued a policy to elaborating the meaning of LRH in terms of aspects such as land sources, rent, dwelling type and entry qualification. It illustrated five ways to develop LRH. 1) To transfer vacant public housing regulated by local government. 2) To merge public housing in use that fulfils standards for LRH. 3) To merge rental houses developed by government or work units. 4) To include houses that were leased at low cost and which were purchased by government or work units in the market. 5) And to absorb suitable houses that were donated by social organizations. During this time, LRH had a secondary position in the social housing model, so only a few paid attention to it.

At the beginning of 2007, the policy "Several Opinions about solving Housing Difficulties of Urban Low-Income Families" was published, signalling the increased importance of LRH in the social housing system. The state not only indicated the responsibility of local government in the social housing construction process, but also emphasized the direction of developing an LRH-centred social housing system. By this time, the role of LRH had changed to become a dominant force in dealing with the urban residential problems of low-income families. LRH construction entered an unprecedented period of development and replaced the central role of EAH. Meanwhile, certain parameters attached to dwellings made reference to the construction of LRH. For instance, floor area was supposed being under 50 m<sup>2</sup> (includes private kitchen and toilet) (The National Developing Office, 2007b). At the city level in Guangzhou, in accordance with national policies, in 2007 local government defined the LRH system in line with aspects of the targeted group, the application programme, management and withdrawal of housing. Apart from well-known in-kind housing provision that operated in lease mode, monetary subsidies are also included in the LRH model (The Guangzhou Government, 2017). In order to adapt to the rising consumption level, the upper limit of entry qualification was raised three times in 2010, 2013 and 2015 respectively (see Box 4.2).

### 4.1.3 Public-rental housing (PRH), 2010-now

#### First proposal of PRH in 2010:

PRH mainly targets the housing difficulties of urban middle- and low-income families. Some areas should consider providing PRH for immigrants who have stable jobs or certain residential length.

**In:** National policy 'The Conductive Opinion about Accelerating Progress of Public-Rental Housing', No. 87, Jun 2010.

#### Definition 1:

PRH is built strictly in line with policy regulations on dwelling type and rent level. Funding for PRH can be obtained from local government or other social organizations, and the local ministry constructs, leases and manages it. PRH aims to alleviate housing problems of local low- and middle-income families, new employees, single residents and migrant workers with stable jobs and certain length of residence.

**In:** Policy of Guangdong Province, 'The Notice about Accelerating Program of Public-Rental Housing', Dec 2010.

#### Definition 2:

PRH is built strictly in line with policy regulations on dwelling type and rent level. It is provided to qualifying local low- and middle-income families, unhoused new employees and migrant workers with stable jobs in the form of leases.

**In:** National policy 'The Management on Public-Rental Housing'. The Constructive Ministry, No. 11, May 2012.

#### Box. 4.3 Definitions of public-rental housing (PRH)

Source: Guangzhou Bureau of Land resource and housing, January 2013.

From 2013, when the EAH model stopped, the government decided to develop PRH as the main force in the social housing system. The PRH is a broader concept whose targeted group involves local low-income families, immigrants and young workers (in Chinese: *Jia Xin Ceng*). Both LRH and EAH only provide for people registered locally (with HUKOU), a number of low-income families without local HUKOU in the city with severe housing difficulties are still excluded from housing security. With respect to the grey area of insurance, which is particularly notable in large cities with considerable numbers of immigrants like Guangzhou, the government aspires to practise the PRH model. In this sense, PRH has a more extended range of coverage than LRH and EAH. No. 87 policy of 2010, in which the aims and secured groups for PRH was firstly proposed. PRH not only provides access to low-income families, but middle-income families and immigrants with stable jobs also have a chance to apply.

At the same time, it drafted some suggestions for attributes of housing and requirements for management. The PRH model makes use of a rental mode to meet housing demands that cannot be fulfilled by the market. Its rental level should be based on the local economic situation and should be dynamically adjusted annually in terms of consumption level. The PRH differs from the LRH in that it has a limited tenure period, that is, three to five years. During the leasing period, renting out own occupied PRH for private purposes is not allowed. Together with basic definitions, ways of developing PRH have been proposed as well: 1) to buy, to transform or to renovate rental houses in the market. 2) To construct new dwellings in areas with a high density of immigrants, such as development zones and industrial zones. New-built houses should be in the dormitory mode, which is under 60 m<sup>2</sup>.

As the pilot city for the PRH project, the Guangzhou government drafted a model for PRH at city level (see Box 4.3). The Guangdong provincial government then defined the concept of PRH, which provides some references to national government (The Guangdong Provincial Government, 2010). In 2012, the definition of PRH was officially formulated at national level. It refers to social housing that is built strictly in line with policy regulations on dwelling type and rent level. It is provided in leasing mode to qualified local low- and middle-income families, unhoused new employees and migrant workers with stable jobs (The Constructive Ministry, 2012). Afterwards, Guangzhou government merged LRH into the range of PRH because of the similar means of support. Hence, PRH became the primary type of social housing system and was significantly developed to meet the housing demands of local low- and middle-income families.

#### 4.1.4 Price-capped housing (PCH), 2006-now

**Definition:**

Price-capped housing, also called double price capped housing, refers to commercial housing that was established strictly in line with policy limits on land price and sale price. In the early period of land transfer, local government added restrictions on price, dwelling type and targeted group to PCH development. Through public bidding, development companies who accept these requirements are able to compete for the right to construct PCH.

PCH is one type of social housing that aims to improve the housing difficulties of middle-income families and control the rapid growth in market housing.

**In:** Policy of Guangzhou city, 'The Notice about Management of Price-Capped Housing in Guangzhou', No. 1, Jan 2008.

**Box. 4.4 Definition of price-capped housing (PCH)**

Source: Guangzhou Bureau of Land resource and housing, January 2013.

While a considerable number of middle- and low-income families have been enrolled in the social housing system, many middle-class households still demonstrate weak ability to purchase housing stock in the free market. Concerning this matter, government formulated a framework for PCH to relieve the housing difficulties of the middle class. The concept of PCH was proposed at national level in 2006, and the beginning of PCH project occurred in Guangzhou city in 2007, when Guangzhou local government formulated a PCH model which was passed on to Guangdong provincial government in 2008 (The Guangzhou Government, 2008).

There is another name for PCH, "double price capped housing", which means both of the land price and the selling price should be in line with government requirements. PCH differs from LRH, EAH and PRH in that ownership belongs totally to private owners. In essence, PCH is subsidized commercial housing that can be freely transferred in the housing market. It is developed with an invisible subsidy from local government. Compared to the selling price of EAH, PCH is more expensive, and purchasers pay all costs from the private side. However, the intervention of government still relieves economic pressure on middle-class buyers in the housing market, and also confirms financial circulation for government.

## 4.2 The progress of social housing in Guangzhou

The history of the current social housing system can be traced back to the early 1990s, when a new provision structure was shaped with consideration paid to both public housing and market housing. During the period 1990–2004, the housing provision structure was unstable the proposed frameworks of social housing were merely trials and pilot tests. Guangzhou local government attempted to improve social housing supply by adjusting related policies and attempting to build several types of social housing, such as the early EAH, called ANJU & JIEKUN housing, and EAH and LRH. In 2005, the national government declared the basic structure of the social housing system (The State Council, 2005). Up to now, the clear direction is to develop a multilevel provision structure to resolve the residual housing problems left by market housing provision. By means of leasing or selling, government supplies stratified dwellings at lower prices to different urban groups (such as local low- and middle-income families, some immigrants or youth) according to their jobs, affordability and living conditions.

The reason for exploring Guangzhou's social housing system is to test the functions of multilevel provision in a typical Chinese metropolis. Firstly, the current model in Chinese cities is a much larger project in comparison with welfare housing in the West. The influences to the local society and urban space are unprecedented. Secondly, the Guangzhou social housing system is a localized structure which has taken the learning experiences of nations such as Singapore, Germany, and the UK. It is a creative project that considers our political environment, local demands, and the process of urban organization. These particularities and outcomes of the multilevel supply structure is worth attention. So far, relative studies on Chinese social housing system have shed some light on the provision structure and actual policies. However, the majority of them rest on simple reporting and summarizing policy clauses and possible implications. Because of the lack of theoretical discussion and logistical analysis on the actors involved, we attempt to extract the key messages from the contents of policy, then to open our study to the progress of the Guangzhou social housing system chronologically along with the topics of provision structure, actor networks, process of allocation and management and socio-spatial impacts.



### 4.2.1 Stages of social housing development in Guangzhou

In the polity of China, the central authority takes responsibility for economic development and social security by controlling subordinate governments by means of policies. Being a significant welfare project, social housing projects are greatly conducted by government in terms of directions, functions and operations. In the formulation of a multilevel provision structure, social housing is policy-driven. The progress of the social housing system is characterized by a gradual expansion of the range of guaranteed groups. From the lowest-income families in early period to low- and middle-income families nowadays, from local residents to immigrants. Therefore, examining policy items chronologically makes sense for clarifying our statement.

#### 4.2.1.1 Infancy stage: EAH-dominated system during 1986–2004

**Provision of JIEKUN housing during 1986–1994.** With progress in the monetization of housing blocks, market housing experienced great development and its role in the housing structure became more important. To compensate for the shrinking supply of work unit-based public housing, Guangzhou government subsidized low-income families with JIEKUN housing during 1986–1991. During these five years, local government attempted to secure homes for families whose average dwelling area was less than 5 m<sup>2</sup> per person. JIEKUN housing mainly used dwelling types of 45 m<sup>2</sup>, and a few of them were constructed with floor space from 40 m<sup>2</sup> to 60 m<sup>2</sup>. Over the next four years from 1992–1995, three JIEKUN communities were established with infrastructure organized into the subdistricts of Tangxia, Datang and Tongdewei. They were called Tangde, Jude and Zede, and in total provided nearly 900,000 m<sup>2</sup> multi-storey houses to 10,163 local households.

**Provision of ANJU housing during 1995–1997.** The real estate market had gradually built up with the deepening of reform in land use and the housing system. In addition to market housing provision, the construction of subsidized housing was proposed in parallel, which acted as a balancing force. With the purpose of stabilizing housing provision, government provided great supports, which include land supply, architectural design and finance, for developing of housing with small interests (*Wei Li Fang*). Meanwhile, housing projects with similar welfare functions (like JIEKUN housing) were involved in EAH projects (The Constructive Ministry et al., 1993). By this time, the EAH model was proposed firstly.

In policy enacted in July 1994, the state illustrated the responsibilities of the nation, work unit and individual in housing provision. The proportion of EAH was suggested to be over 20% in the real estate market (The State Council, 1994). Retired employees, teachers and people with housing difficulties had priority access to EAH. At this time, EAH was a buffer measure against the withdrawal of public housing. The guideline which followed, document No. 761 (The Constructive Ministry, 1994) regulated the details relating to the targeted group, land management, administration and related processes. Following the formal plan for EAH, the state suggested its dominant type: ANJU housing (The State Council, 1995). Guangzhou was assigned as the test city, and its first EAH project was referred to ANJU.

According to guidance from the central government, Guangzhou published local plans to address the residential difficulties of families with less than 7 m<sup>2</sup> per capita living space (The Guangzhou Government, 1997). Its coverage included both low- and middle-income families. At the same time, it required construction, dwelling structure and area: 1) to focus strictly on the provision of middle- and small-size dwelling types. 2) The main dwelling structure is a two-room house with 60–65 m<sup>2</sup> living space. This type comprised 80% of total ANJU housing, and three-room houses (70–75 m<sup>2</sup>) or one-room houses (less than 50 m<sup>2</sup>) comprised 20%. Ownership and disposal right of housing passed to residents gradually after a certain number of years after purchase. From 1995–1997, total constructed area of the ANJU project in Guangzhou had reached 1,400,000 m<sup>2</sup> and over 20,000 local households had been housed. They are scattered among land parcels in Pazhou, Xiaoxintang, Datansha, Jixianzhuang, Huangjinwei.

**Developing an EAH-dominant social housing system during 1998–2004.** The publishing of the policy, “Decision about Deepening Reform of Housing Institution”, signalled the entry of a multilevel housing system (The State Council, 1998). This document was a watershed in the housing provision structure: on the one hand, it completely abolished public housing and replaced it with market housing; on the other hand, it set out the social housing provision structure.

The key work of the social housing project was to build an EAH-dominant system. Construction of social housing in Guangzhou obeyed national direction. The families involved were stratified into lowest-income, low-income and middle-income according to their income levels. While the first group (lowest-income households) had access to LRH, the other two groups had access to EAH. Entry conditions for EAH were family annual income of less than 15,700 yuan and per capita living space of less than 7 m<sup>2</sup>. In comparison, the entry criteria for LRH were very limited. Only the weakest group (*Shuang Te Kun Hu*<sup>8</sup>) was defined as the targeted group by the Guangzhou government. The dominant EAH guaranteed a larger targeted group in the selling mode and LRH played a supplementary role, functioning as a way of leasing dwellings. During this period, EAH took up nearly 5% of market provision in Guangzhou. Most EAH was built in the form of high-rise buildings with 60 m<sup>2</sup> dwelling area. By the end of 2003, five allied ministries at national level had issued detailed constructive standards on LRH such that 30-40 m<sup>2</sup> one-bedroom housing type. Because of the very low rent that is, 1 yuan per square metre per month, a 23.45 billion yuan investment only benefited 1041 households in Guangzhou.

However, the end of dominant role of EAH began with doubts on security groups and a national emphasis on real estate in 2003. No.18 policy re-identified EAH as yuan “market housing with welfare attributes”, and remarked that EAH was making way for commercial housing. In addition, construction periodically stopped in Guangzhou by 2002 because of intensive a lack of land resources.

#### 4.2.1.2 Promotion stage: LRH-dominated system since 2005

Market housing prices have risen significantly since 2003, and kept increasing at a rate of over 10.0% up to 2006 (National Statistical Yearbooks, 2004-2007, Tab. 6-27 & Tab. 6-39). The widening gap between affordability and housing price contributed to a second turn the overall construction of EAH and LRH. In 2005, the state carried out measures to increase the ratio of normal-priced market housing, EAH and LRH. This was aimed at stabilizing the price of market housing (The State Council, 2005 & 2006). Furthermore, a thorough thematic investigation into problems experienced by the EAH project, a government modified definition of EAH and adjusted principles of provision structure to “a coexistence of leasing mode and sale mode, and center on leasing mode”. Since then, rental housing has replaced ownership as the main provision type, which was formally stated in 2006 (The National Developing Office, 2006). Over the next 10 years, social housing construction has achieved great progress in terms of amount and efficiency in cities like Guangzhou.

**Developing an LRH-dominant social housing system during 2006–2012.** In view of the limited influence of in-kind subsidy on LRH, the Guangzhou government launched a new policy and tried to enlarge the insured coverage with a monetary subsidy for qualifying households (The Guangzhou Government, 2004). This measure started from 2005, and achieved significant effects such that 468 local households received subsidies within four months. In the following year, the state stressed the construction of LRH and required all cities to establish LRH models by the end of 2006. The official illustration on the dominant role of LRH began from 2007. Key content was about settling a multilevel social housing system, in which LRH played a leading role and EAH played a supplemental one (The National Developing Office, 2007). Besides, it also elaborated on the LRH targeted group, subsidized mode and standards overall. Following this, the coverage of LRH in Guangzhou expanded to low-income households with per capita living space below 10 m<sup>2</sup>. In parallel, the housing subsidy improved from 230 yuan to 322 yuan monthly. By December of 2007, several designed methods in policy “The Implement of Low-Rent Housing Policy”, kept on extending the guarantee coverage (The Guangzhou Government, 2007b). This policy clearly directed that the purpose of the LRH model was to alleviate the housing problems of low-income families. Additional to the previous “*Shuang Te Kun Hu*”, all low-income families whose average personal disposable income was less than 7680 yuan (less than 640 yuan per month) were included in the targeted group, which had increased by nearly double in comparison with former standards. Nevertheless, single local inhabitants were also allowed to apply for LRH.

<sup>8</sup> *Shuang Te Kun Hu* refers to local registered families who have difficulties on both economic ability and residential environment. The two qualified conditions are: 1) qualified families by the Civil Affair Bureau with low-insured, low-income or special difficult certifications. 2) Family has no private housing, and the per capita living space is less 7 m<sup>2</sup> (The State Council, 1998).

In order to meet increasing demands, a large number of LRH housing stocks were gradually constructed in Guangzhou over next six years. In 2007 and 2008, seven LRH projects were launched in succession; they were the second project of Tongde in Biayun district, the second project of Datang in Haizhu district, Dang'en project in Zhongshanba street in Liwan district, Wansongyuan in Haizhu district, Maofangchang and Tai'an on residual land parcels in Tianhe district, and Jinshazhou project in Baiyun district. In total, 8859 housing units were built, and 5643 households received in-kind housing subsidies. The benefitting families include registered "*Shuang Te Kun Hu*", low-income families and some resettled families. This achievement is a milestone in the LRH process, which marked the periodic success of the new provision structure. The construction kept going after 2008, and another 20 projects had been erected by the end of 2011, and additional 36,201 households received in-kind subsidies from the LRH model.

Nevertheless, after suspending EAH provision in 2002, the Guangzhou government restarted the project in 2006. Four projects established that year, two of which lay in Liwan district, in Huangsha road and Fangcun respectively, one project was located in Xingang road in Haizhu district, and another one was situated in Huangshixi road in Baiyun district. Then, a remarkable stimulation from the national government focused on substantive development of EAH (The National Developing Office, 2007). Guangzhou local government carried out detailed methods in terms of the policy "The Implement on Economically affordable housing Policy" (The Guangzhou Local Government, 2007a), in which the requirements were drafted for construction standards, application, entry process, ownership and later management. This policy limited construction space to within 60 m<sup>2</sup> and sale to the principle of low-profit. From 2008, yearly guaranteed numbers of EAH were around 4,000 households in average. Most EAH was established together with LRH on respectively same land parcels, such as social housing communities in Jinshazhou, Fanghe, Guangdan, Tai'an and Guocun. The majority of housing stocks in these communities are type LRH type, with a small percentage of buildings simultaneously built to EAH standards.

Besides great progress in LRH and EAH, local government also put forward the idea of PCH and PRH. In order to form a perfect multilevel supply structure giving families of any income level access to affordable housing, Guangzhou put forward the concept of PCH to meet the housing demands of middle- and upper middle-income households. Policy that adjusted the housing provision structure identified the principle "*Shuang Xian Shuang Jing*"<sup>9</sup> to develop PCH (The National Developing Office, 2006). The purpose of this model was to fulfil the demands of middle-income families for a private dwelling. The living space of PCH should below 90 m<sup>2</sup>, and the selling price of PCH was suggested to be 70% of similar market housing in the same location (The Guangzhou Government, 2008). However, to avoid disturbing the market mechanism, it only targeted to a small number of people with restricted requirements for registration, age, household assets and ownership. Priority goes to first-time house buyers, with an annual income of less than 70,000 yuan, with local HUKOU and must be married. Beneficiaries were forbidden to transfer ownership in the first five years after purchase. If they do, buyers must repay the subsidized part to government. Provision of PCH remained in the testing stage at this time, and only 2848 units had been completed by 2012. At the same time, to confront the housing difficulties of migrant workers, new employees and lower middle-income families (so called *Jia Xin Ceng*) still excluded by insurance range, the central government came up with idea of PRH. At city level in Guangzhou, PRH underwent a planning and design stage from 2010 to 2012.

In conclusion, during the period 2005–2012, more than 20 new projects of different size and dwelling type were set up, such as large-scale communities like Jinshazhou, Fanghe, Guangdan, Tai'an, Anxia, and small-scale communities like Guocun and Dang'en. In addressing the priority role of LRH in social housing supply, construction in Guangzhou mainly focused on LRH during this time. According to a report of Guangzhou government in 2010, new-built LRH guaranteed 36,201 households, which means 87% qualifying families have received dwellings, and the EAH model provided homes to 7,875 households. Apart from these new projects, government also transformed some small, early teachers' houses into the EAH category, such as Jixian, Yulong, Yunquan and another five neighbourhoods in Baiyun district. All actions this time can be defined as exploring and modifying the multilevel provision structure. Not only LRH and EAH

<sup>9</sup> *Shuang Xian Shuang Jing*: a principle of making decisions on the final developer for PCH projects. On the basis of limitations on dwelling and selling price, government determines the winner by way of comparing their proposed housing prices and land prices (The National Developing Office, 2006).

experienced comprehensive development, as PCH and PRH also made the first step. Nevertheless, PRH has not launched substantially, as the first draft of the multilevel social housing system is still being established.

**Developing a modified multilevel social housing system: PRH-dominant provision since 2013.** Intensive construction contributed to housing security for local low-income families and successful achievement in the first stage put forward further requirements for larger insurance range. The work was implemented from two dimensions: to increase the upper level of low income every year, and to advocate a PRH model that is easier to access for all residents like migrant workers and new employees without houses. In 2012 and 2013, there was a vital change, Guangzhou stopped the provision of EAH and merged LRH into the PRH model (The Guangzhou Office of Housing Security, 2013a & 2013b). Since then, LRH has acted as a type of PRH for low-income families, and other housing targeted at *Jia Xin Ceng*. In spite of adjusting the structure to become a PRH-dominant one, the principles of multilevel provision have been retained in the social housing system. In 2013, ten new PRH projects were established. Because of the spatial distribution of new employees, several large-scale projects were situated in development zones like Longgui and Luogang.

#### 4.2.2 Provision structure for social housing in Guangzhou

From a review of social housing development in Guangzhou, we identify the provision structure for this model (see Fig. 4.1). The figure demonstrates the relationship between social housing types and various populations. For the purpose of forming a multilevel provision structure, Guangzhou government has implemented the concepts of EAH, LRH, PCH and PRH.

Before 2012, LRH and EAH were the main types of social housing model. PCH functions as an auxiliary project. It is important to mention that so-called EAH not only means housing stocks that were built after 1998, but also includes JIEKUN and ANJU housing that built early on with government subsidies. In our study, JIEKUN and ANJU are both regarded as components of the EAH project. As indicated in Fig. 4.1, the LRH model targeted the lowest- and low-income families, while the EAH model aimed at solving the housing difficulties of middle- and low-income families. Compared to the large subsidies on LRH and EAH, a small amount of PCH only is targeted at middle-income families at much higher prices. PCH is operated as normal commercial housing without direct subsidies from government but there are interventions in land price and sale price. Despite insurance methods principally formulated in a stratified structure along the line of income level, a clear limitation is reflected in the exclusion of three groups (migrant workers, new employees and lower middle-income families), who are also referred to as *Jia Xin Ceng*. No matter at what income level the immigrant, the HUKOU system built a barrier to their entry qualifications. Nevertheless, the shortage of supply owing to high demand and the restricted entry conditions for EAH and LRH jointly led to a blind spot in guaranteeing structure in terms of income level. Less economic pressure of local lower middle-income families resulted in their difficulties in accessing LRH because of the priority principle favouring low-income people. Meanwhile, they lack the ability to afford to buy EAH. As a result, they were mostly outside the insurance coverage by suffering the same difficulties on housing demands.

In order to meet residual but urgent housing demands, government put forward the notion of PRH in 2012 and defined it as the dominant force in the social housing framework. Subsequently, the framework of a multilevel provision structure was finally formed. As we can see on the right-hand side in Fig. 4.1, the coverage of PRH not only addresses the housing demands of lowest- and low-income households, but also extends to meet the needs of migrant workers, new employees and lower-income households. In comparison to the provision structure prior to 2012, adding the PRH model takes more weak groups in Guangzhou city into consideration. Particularly the population who are weak in economic ability but mostly excluded by HUKOU or the qualifying process. For instance, young workers who have urgent housing demands. Although their income levels would be higher than the low-income level, they still do not have enough economic ability to purchase dwellings in the market in the short term. Hence, the LRH and rental mode social housing are jointly classified as PRH, without considering the differences in targeted groups. There is a notable adjustment in that PCH also has wider coverage since 2012, as both middle-income and upper middle-income families are included. The purpose of EAH provision remains securing mainly local households with an income level of low to middle. By this time, the current multilevel provision structure has been primarily formulated. People who are living in Guangzhou city with housing difficulties became the targeted groups of various housing models in the social housing system. Besides

the simple selection of lowest-income people and migrants, other residents possess two to three forms of access – either renting or purchasing is possible. In comparison to gaps in previous structure, the ongoing supply structure after 2012 has more streamlined connections between the PRH, EAH, PCH models and market housing. Multilevel provision not only assures basic housing for each group, it also makes sense in terms of diversity in housing provision.

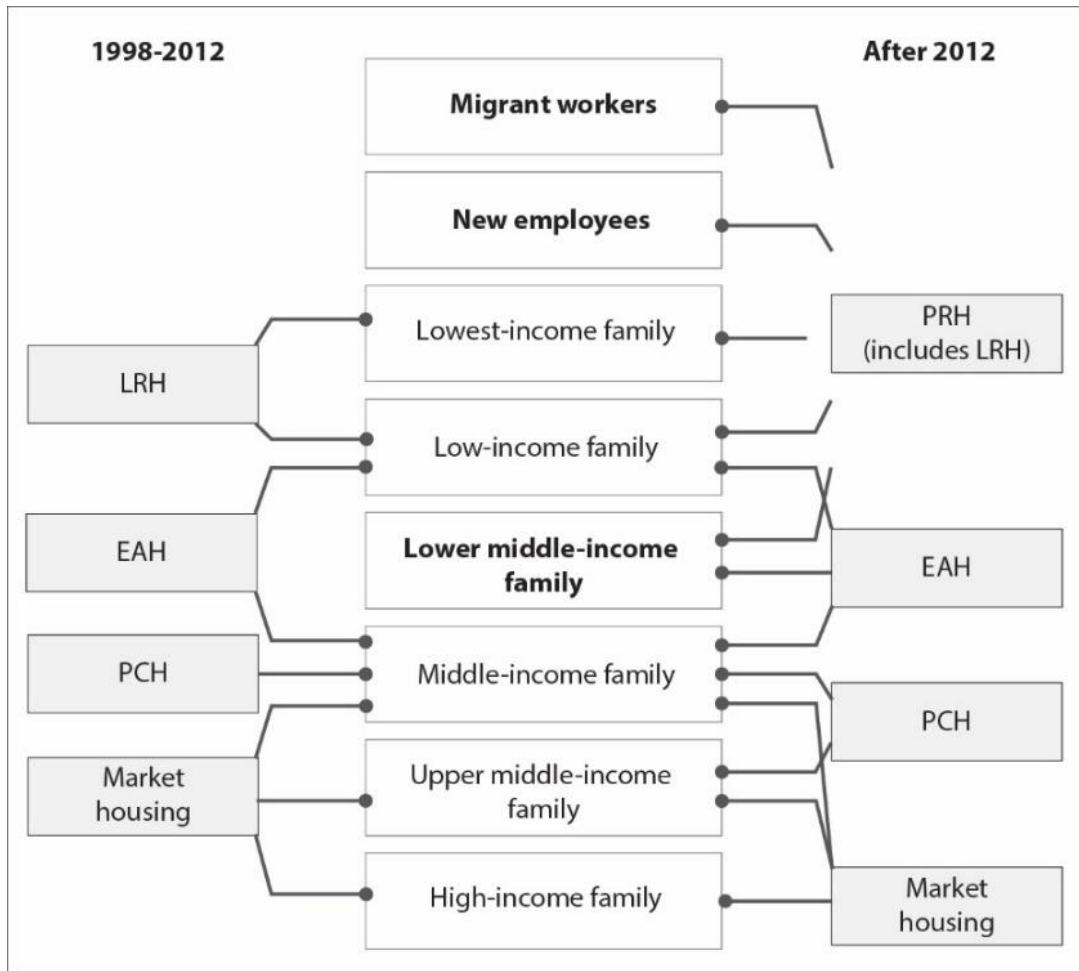


Fig. 4.1 Relationship between the provision of urban housing and residents before and after 2012, Guangzhou

Source: Own draft, May 2014.

#### 4.2.3 The construction of social housing in Guangzhou

Our study primarily divides the course of social housing in Guangzhou into two phases: an EAH-dominant system during 1994–2004 and an LRH-dominant system since 2005 (see Tab. 4.1). The data were collected from internal documents, such as policies and reports of Guangzhou government. However, the yearly amount of housing provided and the annual number of secured families were not available in official statistics. In view of the limitations of data sources, particularly information before 2005, we mainly use a periodic summary in the EAH-dominant period instead of annual data.

Before 2004, it is apparent that social housing construction in Guangzhou focused mainly on JIEKUN and ANJU projects when addressing EAH. During this period, a total 10,161 and 20,000 families were secured respectively. And 909 low-rent housing had been allocated to lowest-income families by 1998. EAH played a dominant role in addressing housing difficulties among local residents. Since 2005, the government has started to emphasise the significance of rental housing rather than selling EAH housing. This in turn has led to great investment in LRH construction. With the completion of several big projects in 2008, the numbers of both LRH and EAH increased a lot. From 2005–2008, a total

of 5,039 dwellings of LRH were allocated to low-income families, and 2,625 dwellings of EAH were sold to qualifying families at the low- or middle-income level. Then, the PRH model continuously focuses on the construction of subsidized rental housing. Three kinds of social housing, LRH, new projects of PRH and EAH, all showed a sustainable increase. The increasing number of new projects erected is proof of the development of the social housing system, though the number of guaranteed families every year is not stagnant.

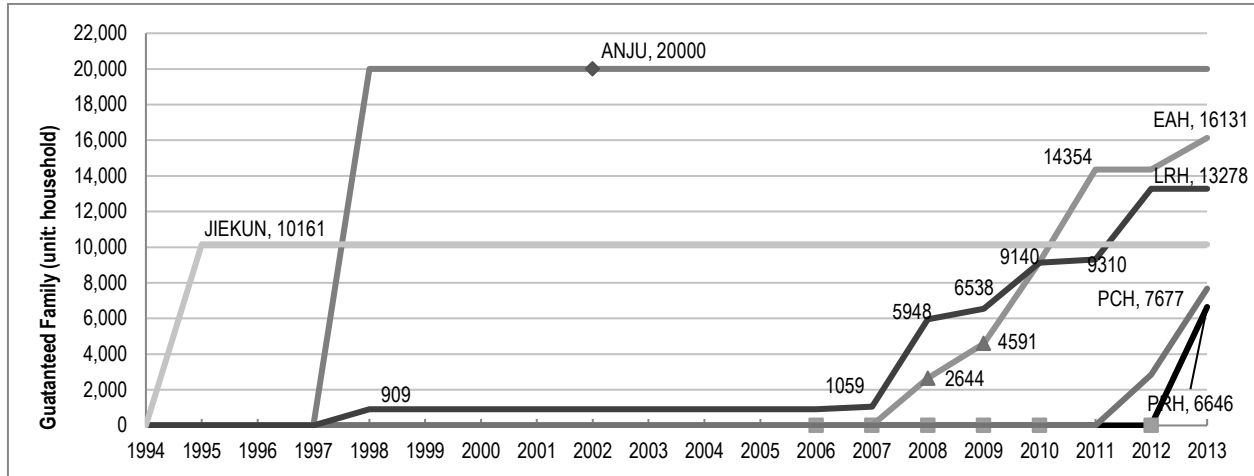
In parallel to housing construction, government also offered a monetary subsidy to qualifying families from 2005. Instead of waiting for housing blocks, qualifying families can choose to accept subsidies from government of rent suitable houses in the market. Because of no cost on construction, this measure achieved great success in a short time with 2,270 families guaranteed housing during 2005-2007 and 14,111 families in 2008. With the progress of LRH construction, beneficiaries of monetary subsidies were gradually replaced by in-kind subsidy. As may be seen from the data on the monetary subsidy from 2008 to 2013, the number dropped rapidly to 4756 in 2011, and then fell to zero from 2012.

Since 2013, the key project of social housing system is PRH. 6646 dwellings of PRH came into use in the year 2013. The enormous number of dwellings under construction (around 55,120) reflect the rental housing in the form of PRH which will have great effects after 2013. PCH also presents a rising trend. In contrast, construction on EAH reduced greatly at this time, with only 2,943 new houses being added and 1,777 EAH distributed to people.

**Tab. 4.1 Construction progress of social housing system in Guangzhou (unit: household)**

		PRH (Public-Rental Housing)					EAH (Economically Affordable Housing)						PCH (Price-Capped Housing)			
		LRH (Low-rent housing)			New PRH (Public-Rental Housing)		EAH after 1998		JIEKUN		ANJU		Resettlement			
		In-kind subsidy		Monetary subsidy												
		Guaranteed families	New projects	Guaranteed families	Guaranteed families	New projects	Guaranteed families	New projects	Guaranteed families	Guaranteed families	Guaranteed families	New projects	Guaranteed families	New projects		
EAH-dominant	1994-1995	--	--	--	--	--	--	10161	--	--	--	--	--			
	1996-1998	909	0	--	--	--	19	0	--	20000	--	--	--			
	1999-2004	0	0	--	--	--	0	0	--	--	--	--	--			
LRH-dominant system	2005-2007	150	0	2270	--	--	0	2625	--	--	--	--	--			
	2008	4889	0	14111	--	--	2625	missing	--	--	691	--	--			
	2009	590	14774	10583	--	666	1947	4360	--	--	154	--	--			
	2010	2602	4070	4300	--	15523	4568	6026	--	--	0	1896	--	4717		
	2011	170	1980	4756	--	11498	5195	missing	--	--	0	640	--	2560		
	2012	3968	12895	0	--	27433	0	2943	--	--	0	1834	2484	400		
	2013	0	missing	0	6646	missing	1777	missing	--	--	0	missing	5193	missing		
<b>Total</b>		<b>13278</b>		<b>36020</b>	<b>6646</b>		<b>16131</b>		<b>10161</b>	<b>20000</b>	<b>845</b>	<b>7677</b>				
<b>Plan after 2013</b>		21513		5500	41354		15165		--	--	4620	5149				

Source: Guangzhou Bureau of Land Resource and Housing, Aug 2013.



**Fig. 4.2 Numbers of guaranteed families supplied with social housing in Guangzhou**

Note: The trend line of LRH only demonstrates quantity of families who were guaranteed in-kind housing, while families who accept a monetary subsidy declined. Source: Guangzhou Bureau of Land Resource and Housing, January 2013. Draft: R. Chao. 2015.

### 4.3 Interactions between actors in the social housing system in Guangzhou

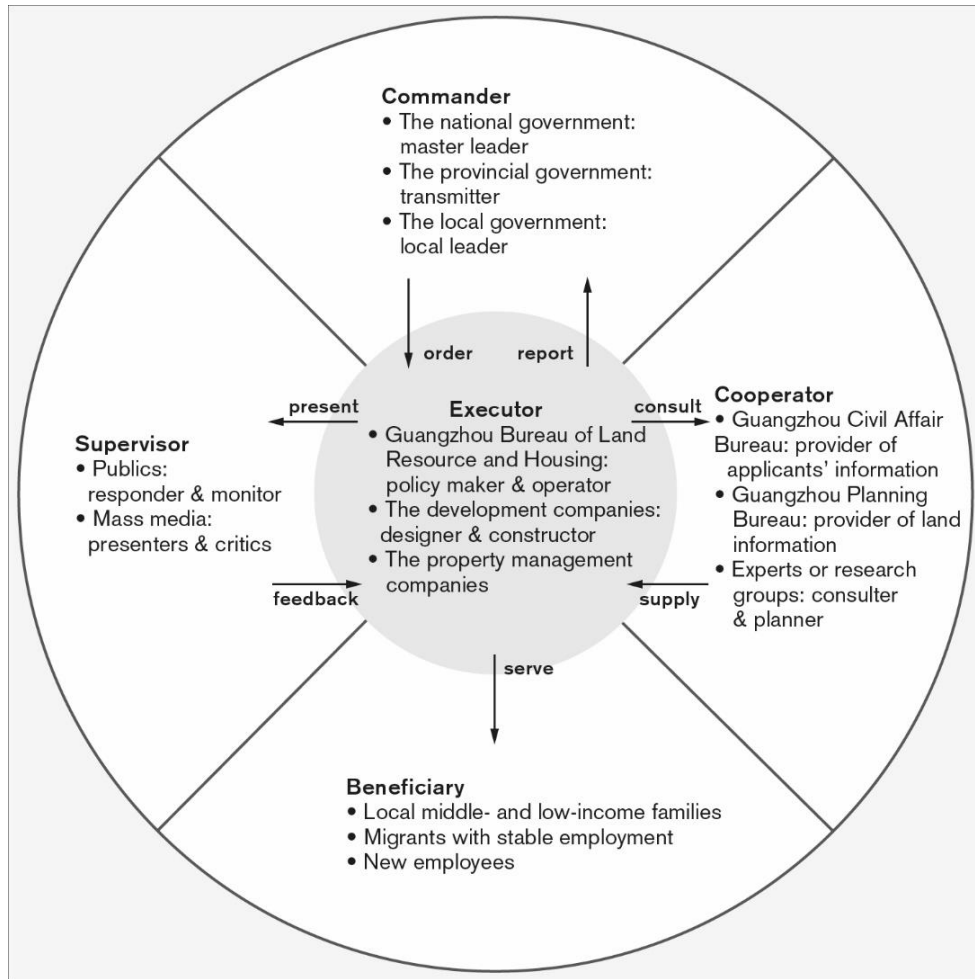
#### 4.3.1 Organigram of actors

The successful running of the social housing system cannot happen without well-organized actors. The effective role and function of each actor operates as the fundamental support of a system. Some approaches attempt to reveal the operative mechanism by depicting interactions between actors graphically. For instance, dramaturgical analysis used by Hajer (2005) in exploring actors' interaction during policy deliberation of Hoeksche Waard. Drawing some ideas from these analyses, our study sketches an organigram (see Fig. 4.3) of all the actors involved, and their roles and relationships, to demonstrate how actors are organized in the social housing system of Guangzhou.

The actors of social housing system not only contain governmental agencies and secured citizens, but also encompass selected companies for construction or management, research entities and mass media. In terms of their functions, we classify these organizations into five categories and refer to them as commander, executor, supervisor, cooperator and beneficiary respectively (see Fig. 4.3).

Administrations are organized in a hierarchical structure, in which higher-level ministries possess the right to control subordinate agents. From national level to city level, the goal of social housing provision becomes specific and feasible. In this sense, authorities are primarily responsible for formulating policies. When national government proposes the mission of social housing, Guangdong provincial government accepts it and then assigns the city government of Guangzhou to draft detailed measures. That is to say, the top leader of the hierarchy, national government, structures the basic form of social housing provision, Guangdong provisional government then proposes the localized goals, and the city government of Guangzhou takes charge of designing specific policies (e.g. rules about construction and management) to ensure the running of the system at local area. In this sense, these governmental actors act as the commanders in the social housing system of Guangzhou.

The central position in the organigram is taken by the executor who is responsible for the actual work on housing construction, allocation and management in Guangzhou. Guangzhou Bureau of Land Resource and Housing (GBLH) and selected developers in the housing market cooperatively complete a series of activities related to social housing provision. Thus, GBLH dominates the works during the whole process. The organization takes charge of land reservation, location, construction, allocation and later management. At the same time, GBLH also decides which companies are qualified for construction and neighbourhood management.



**Fig. 4.3 Organigram of social housing system, Guangzhou**  
 Source: own draft, 2014.

To support normal operations, GBLH also needs helps from other organizations. The main partners are Guangzhou Civil Affair Bureau (GCAB), Guangzhou Planning Bureau (GPB) and experts. These groups provide valuable information on different procedures to ensure the running of the system. In the stage of land reservation and supply, GPB offers data on potential or usable land parcels for residential construction. When comes to housing allocation, GCAB mainly assists by ascertaining the income and household assets of applicants. Contributions by experts or research groups are ways of adapting the social housing model to local conditions.

In terms of the current targeted groups of the social housing model, local residents from the low- to middle-income level make up the largest proportion of beneficiaries. With the broadening of the scope of coverage of PRH and PCH, some migrants with stable jobs and upper middle-income citizens have become part of the beneficiary group.

Besides the above actors that are directly related to the work of social housing projects, some public entities also pay close attentions to it. For instance, the mass media may influence recognition of the merits or shortcomings of the current system by reporting phenomena related to local projects or of other places. The first public participation in policymaking procedure occurred in September 2007, where an attempt was made to adjust draft clauses of the policy “The Implement of Economically affordable housing Policy” by collecting feedbacks from the public. The advantages of these public powers are that they not only supply information to people, but also make it possible to supervise the running of the system from the perspectives of the public.



### 4.3.2 Interactions of administrative actors

The social housing system is a policy-driven project that operates mainly at city level. Apart from cooperation with some organizations in the market system or public groups, most actors are ministries in the governmental system. The previous statement indicated the role of agencies that involved into Guangzhou social housing model. This section we will focus on how administrations interact and relate to each other. Making use of the principles of actor networks, relationships between all ministries functioning at the national, local and neighbourhood level will be shown in Fig. 4.4.

#### Interactions among actors in the governmental system

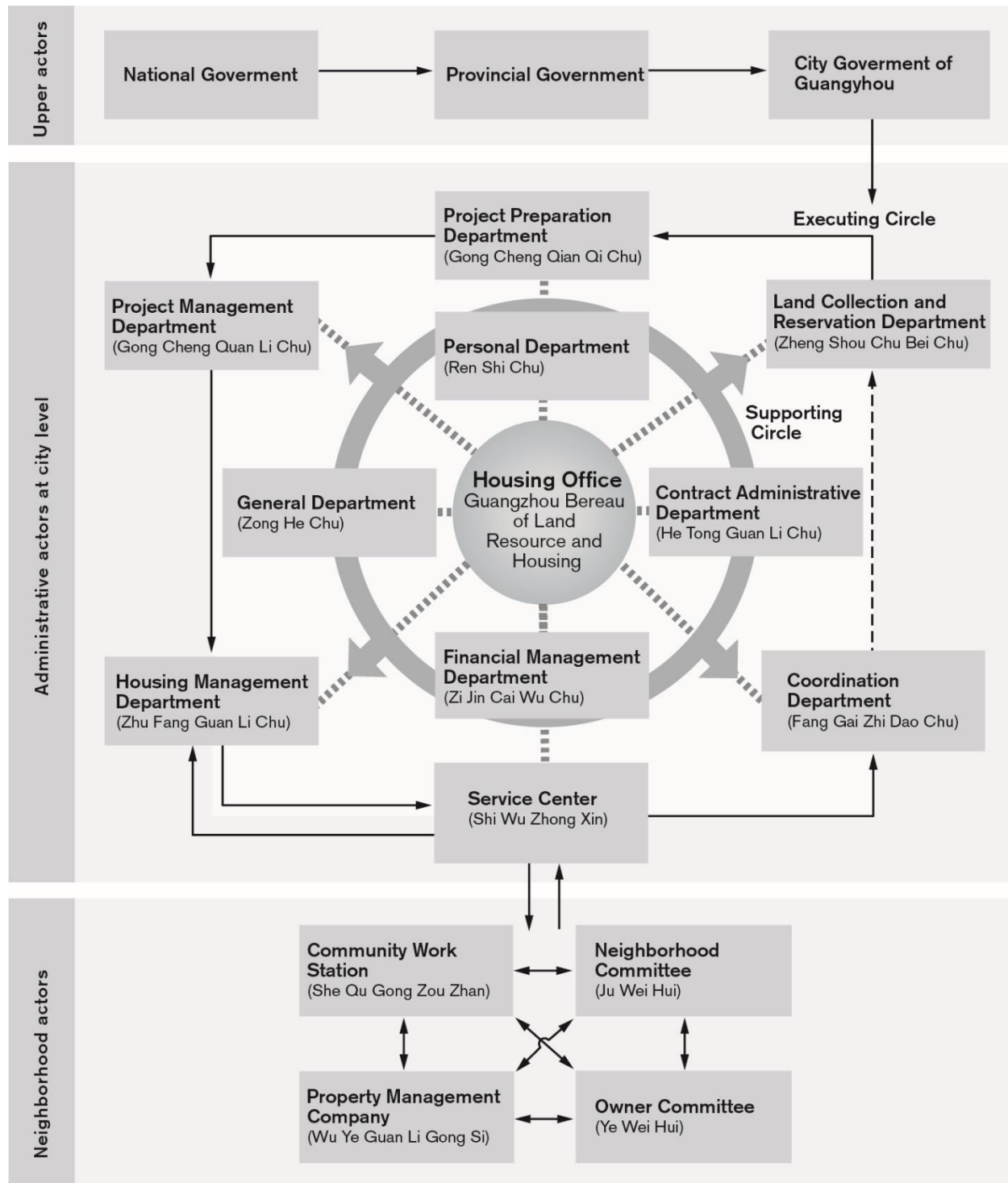
Firstly, upper level administration includes national government, Guangdong provincial government and Guangzhou city government. National government's orders pass successively along the hierarchical structure from top to bottom. The mission statements come to the city level in Guangzhou, the ministry of GBLH acts as the main force in developing social housing projects. The functions of GBLH cover mainly the work of policymaking, land reservation and provision, housing construction, allocation and later management. Hence, we emphasise the organs in GBLH to demonstrate how they are act in operation.

The housing office, a subordinate ministry of GBLH, is the key actor responsible for project development. Its subsectors take on different jobs in each stage. Four of them (i.e. personnel department; general department, financial management department and contract administration department) are supporting sectors and six sectors (i.e. land collection and reservation department, project preparation department, project management department, housing management department, service centre and coordination department) act as executors.

On the inner ring around the housing office (see Fig. 4.4), four supporting actors provide needed information, capital or basic assistance with documentation to the housing office. Their functions ensure the fundamental running of housing projects. With the support of this circle on aspects of labour, finance and documentary compiling, the other six departments placed in the outer circle are able to perform in the construction stage.

The social housing project starts with preparation work on land provision, housing design and construction. The land collection and reservation department takes charge of all matters that are related to land parcels. This department manages detailed information on land parcels and suggests suitable ones for social housing construction. After confirming the land parcels for construction, the project preparation department (*Gong Cheng Qian Qi Chu*) takes over the task and drafts the plan, which includes the layout of the community and the number of each housing type. When the draft of the project is verified, the project enters the construction stage. The project management department takes charge of the construction process, which entails identifying the construction company, supervising the schedule, inspection and acceptance.

Afterwards, housing distribution and management take place in a later period. The housing management department focuses on process of determining entry requirements. Regarding the mismatched situation caused by short supply and urgent demands, this ministry is not only responsible for setting a reasonable entry threshold, but also designs acceptable processes for housing allocation. Then, the service centre start functioning in terms of management. This department runs the social housing communities. Its connections with different ministries that function at neighbourhood level, ensure a match between residents and housing, as well as maintenance, and further investigation. Feedback collected by services centre will be sent back to the coordination department, which contributes to improving projects in the future.



**Fig. 4.4 Interactions among administrations in the social housing system of Guangzhou**

Source: own draft, 2014. Base data source: a) Investigation in Guangzhou Bureau of Land Resource and Housing, May 2014; b) expert interviews on policy maker Ms. Liu, Jan 2013.

### Functions of neighbourhood organizations

The welfare attributes of social housing contribute to more intervention by government in neighbourhood management for confirming the working of some necessary functions. The neighbourhood of social housing commonly possesses four administrative groups (see Fig. 4.4). In order to improve the management of detailed issues during residence, the service centre establishes a subordinate workstation in each social housing community. This supervises the running of

the community and coordinates interactions between the other neighbourhood actors. The neighbourhood committee is the terminal sector of Guangzhou civil affairs bureau, whose work focuses on population management. At the same time, government employs a property management company to take care of physical matters concerning residents, such as housing maintenance and neighbourhood security. The owner committee is a spontaneous organization, whose key members are elected by democratic voting. This representative group voices residents' opinions to governmental agencies, with the aims of protecting owners' living conditions. They function jointly to improve community development.



Administrative Office of FANGHE Community

**Fig. 4.5 Administrative office of Fanghe community**

Source: Photograph by CHAO, January 21st, 2013; map from Guangzhou Bureau of Land resource and housing, Jan 2013.



Administrative Office of TANGDE Community

**Fig. 4.6 Administrative office of Tangde community**

Source: Photograph by CHAO, January 24; map from Guangzhou Bureau of Land resource and housing, Jan 2013.

The neighbourhood workstation acts as the link between local government and neighbourhood-based organizations. On the one hand, it conveys policies to three other organizations and residents and supervises outcome implementation. On the other hand, it relays local problems during the operation mechanism to the service centre for help in decision-making. Except for some very small ones, most social communities have a physical workstation in their community. For example, the administrative office in Fanghe (see Fig. 4.5) is located in an inner building in the

community. It includes the offices of the workstation and the property management company. Similarly, the administrative office of Tangde (see Fig. 4.6) is situated in office space in an inner building and all local administrative sectors jointly work together. Spatial proximity to the residential environment not only improves communication between the administration and residents, but is also convenient for information collection, inspection and interaction among agencies. Effective communication between local agencies is of benefit in handling matters related to residents or conflicts between residents and the administration.

#### 4.4 Housing allocation and management in Guangzhou

The operation of the social housing model in Guangzhou is based on the successful running of a series of policies or regulations that conduct the work in each step. In these two sections (4.4 & 4.5), our study respectively introduces details about operations after construction and procedures before built-up. The later-period operation includes defining entry standards and distributive procedures, community supervision and management, and implementing regulation clauses such as penalty rules. The tasks in the earlier period include land reservation, site selection and project construction.

Because the process of allocation and management are fully conducted by local government, we will focus on applied principles to demonstrate operation and its implications. The first turn of related policies was issued in 2007. The construction ministry of China structured basic management rules for LRH and EAH in documents No. 162 (The Constructive Ministry, 2007) and No. 258 (The Constructive Ministry, the National Council of Developing & Reforming, 2007). In accordance with national suggestions, the housing security sectors of Guangzhou designed locally based measures on entrance and withdrawal mechanisms (The Guangzhou Government, 2007a & 2007b). Then, in 2010, Guangzhou government improved these measures in terms of a more normative and comprehensive organization (The Guangzhou Office of Housing Security, 2010a & 2010b). In addition, guiding principles for PRH and PCH were also developed to execute allocation and management respectively. The arrangement of housing allocation and recycling involves several procedures like determining targeted groups and setting the entrance threshold and price level, designing the distribution procedures, the ruling management principles and the withdrawal procedures. In this section, we will elaborate on successive related policies of Guangzhou.

##### 4.4.1 Targeted group and entrance standards

National government empowers local government to determine detailed standards for targeted groups in terms of local situations. Guangdong provincial government proposed qualifying entrance of people for various social housing mainly by personal income level and living conditions (The Guangdong Provincial Government, 2008). By collecting related policies published by local government from 2008, we summarize the standards in Tab. 4.2.

As we know, LRH is targeted at local low-income families. The entrance standards of LRH are fixed at 150% of local minimum subsistence level and at 10 m<sup>2</sup> level of per capita living area (The Guangdong Provincial Government, 2008). Usually, the government sets an upper limit on personal income and on living area, and then local people who comply will file an application. The standards are renewed annually in terms of overall level of living conditions and economic ability of the local population. With time, the upper standards of low-income people in Guangzhou have improved several times (see Box 4.2). By 2012, the annual disposable income of an individual had increased to 15,600 yuan, which means 1,300 yuan per month (see Tab. 4.2). At the same time, the average living space of an applicant should be below 10 m<sup>2</sup> and net asset value is not more than 70,000 yuan. Similarly, the entrance standards for EAH are also based on personal income level, assets and living conditions. Only the level rises to some extent. The upper limit for EAH was suggested as being set at 150–200% of minimum subsistence level and 10 m<sup>2</sup> living area per person (The Guangdong Provincial Government, 2008). The annual income of each person should be under 18,287 yuan, the net asset value not over 110,000 yuan, and per capita living area less than 10 m<sup>2</sup> (see Tab. 4.2).

In addition, the targeted group for PRH includes lowest-income families, low-income and lower-middle-income families, new employees and migrants with permanent employment. Guangzhou local government defines the upper income limit differently according to the disposable income of urban residents the previous year. In 2013, this level was set at 60% of per capita disposable income, which was approximate 100,000 yuan (see Tab. 4.2). Compared to the levels of

most cities, such 101.31% in Beijing, 111.44% of Tianjin, the coverage of Guangzhou stays at a comparably low level (The data is from inner statistical data of GBLH: An overview on urban housing standards in terms of income, assets and living conditions in several cities of China, 2013). With respect to entrance conditions for PCH, local government requires an annual income below 100,000 yuan and no housing property. However, only locally registered people or households have access to PCH. To conclude, there are two main features of the entrance standards. Firstly, locally registered people have an advantage in obtaining social housing security over many migrant workers. Secondly, entrance is mainly in accordance with personal economic ability. No doubt, the upper limit of PRH is more flexible and time-based. Defining the per capita disposable income of the previous year may be a better way to adjust to the local situation.

**Tab. 4.2 Entering standards for each applicant of LRH, PRH, EAH and PCH, Guangzhou**

Housing Type Standards	LRH <sup>a</sup>	PRH <sup>b</sup>	EAH <sup>c</sup>	PCH <sup>d</sup>
Yearly income (CNY)	≤ 15,600 yuan (1,300 yuan per month)	≤ 100,000 yuan	≤ 18,287 yuan (1,524 yuan per month)	≤ 100,000 yuan
Net asset value	70,000 yuan	70,000 yuan	110,000 yuan	no limit
Dwelling area	≤ 10 m <sup>2</sup>	≤ 15 m <sup>2</sup>	≤ 10 m <sup>2</sup>	no property housing
Local HUKOU	yes	no	yes	yes
Content of family asset	<ul style="list-style-type: none"> <li>• Back deposit</li> <li>• Land, housing stock</li> <li>• Autos</li> <li>• Investment assets: including enterprises stock, foundation, bond and so on</li> <li>• Collection</li> </ul>			

Source: own draft, 2014. Data source: <sup>a</sup> "The Notice about Improving Upper Limit on Income of Low-rent Housing". No. 124, Aug 2012. <sup>b</sup> The Implement Methods of Public-Rental Housing Model in Guangzhou (Trail). No. 3, May 2013. <sup>c</sup> "The Implement on Economically affordable housing Policy". No. 48, Dec 2007. <sup>d</sup> "The Notice about Management of Price-Capped Housing in Guangzhou". No. 1, Jan 2008.

#### 4.4.2 Price level

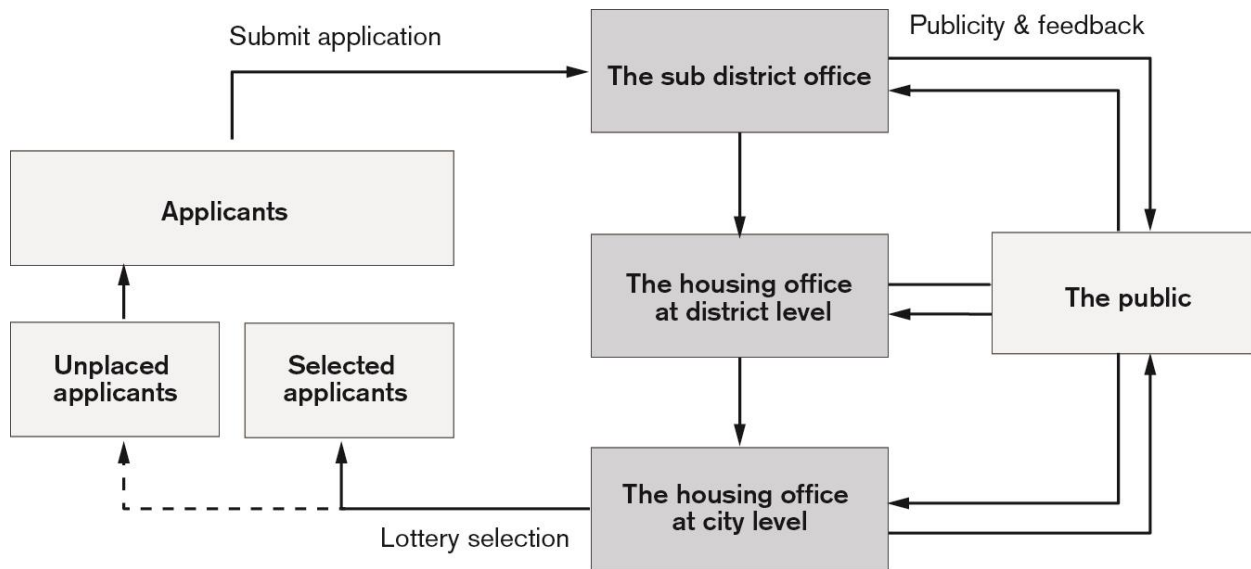
Recently, the rent of LRH and PRH, and the price of EAH and PCH have been principally decided by local government according to income and the consumption level of citizens. Currently in Guangzhou, the rent of LRH and PRH is set at a level lower than 80% of the average rent of market rental housing. Due to the non-profit principle, residents only pay 1 or 2 yuan rent for every square metre monthly. However, the low rent has resulted in certain problems for local government in terms of monetary circulation. If this low rent principle continues, it may exacerbate difficulties with housing maintenance. Some researchers suggest setting prices by referring to the market rental price in the area around the housing location. By applying some mathematical formulae (e.g. inverse decay weight, Kriging interpolation method) on the surrounding space, studies have tried to deduce the value of the social housing location (Zhang, Wang & Hu, 2011). However, this method disregards the income level of the targeted people. In addition, the study by Wei et al., intended to identify entrance standards according to a sample survey of household income, and then calculated using the conversion of normal distribution and uniform distribution as method (Wei et al, 2011). As to the price of EAH, local government take meagre profit as a principle; government states that EAH is sold without any purpose of profit. The interest level of housing stocks that are developed by market forces should be lower than 3% (The constructive Ministry; The National Council of Developing & Reforming et al. 2007). Nevertheless, the price of PCH is required to be lower than the price decided when selling land parcels (The Guangzhou Government, 2008). The above statements about the principles for pricing indicate that only PCH may give some returns on the construction costs and housing maintenance, LRH, PRH and EAH are all developed with a great dependence on local government subsidies.

#### 4.4.3 Entrance qualification process

In Guangzhou, the housing office has proposed its own procedure, which is called *San Shen San He*, to ascertain whether applicants qualify on three levels. This means the information of applicants and results are posted to the public three times at sub district level, district level and city level. Any doubts or fakes found can accordingly be responded to the office. The aim of this public-based surveillance is to ensure the transparency and fairness of the entrance process.

As shown in Fig. 4.7, people firstly submit their applications by filling in an application form. Personal information submitted about family members, income, occupation and living conditions will be posted by the office of the sub district in the administrative area. Then, the public can respond to the office about contradictions or mistakes in the application forms displayed. After collecting feedback and adjusting the list, the applications will be sent to the higher-level office in the district. A similar process of publicity and feedback takes place, and then the application goes to the housing office in Guangzhou city. Now, the public notice is displayed for scrutiny for the third final time. When no reservations are expressed by the public, the qualification of applicants for social housing is determined. The details of each posting are shown below.

- First test. After applicants' submission, the sub district office should complete an investigation of applicants through personal inquiry and neighbours' confirmation within 20 days. The information that has to be checked contains HUKOU, income, housing, assets and so on. The result is supposed to be announced in applicants' residential community for 10 days. Applications that are not approved will be refused and approved those will be passed on to district organizations.
- Re-examination. Within 15 days after receiving the result from the street office, the district sectors will check the qualification of applications with related authorities like the civil affairs bureau.
- Final publicity. Within 10 days after getting the result of the re-examination, Guangzhou Office of Housing Security will certify information of applicants with city civil affairs bureau and post it on a public website for another 10 days. The qualifying applicants who have been approved by both the political examination and public supervision are allowed to be listed on the waiting list for social housing as candidates.



**Fig. 4.7 The procedure for qualifying for social housing**

Source: own draft, according to document of Guangzhou bureau of land resource and housing. May 2014.

#### 4.4.4 Housing distribution

After this threefold entrance examination, the eligible applicants enter the next stage: housing distribution. Where housing is in short supply, the Guangzhou government conducts a random lottery as the main method to select applicants who get a chance to obtain housing stock (see Fig. 4.7). Unplaced people go back onto the waiting list with other new applicants, and restart the process for the next housing allocation. To ensure housing is allocated in a just and reasonable manner, the local authority firstly sorts applicants in descending according to their score, then uses the lottery to decide qualification for housing of all entered families. The detailed principles here include six successive points in:



- To endure qualification by scores  
Deciding the number of selected applicants in terms of numbers of housing that are to be distributed. The more difficult the living conditions, the higher score the applicant is awarded. Families are rated from high to low scores. Those with higher grades have priority to obtain housing stocks.
- If quantity of allocated houses exceeds the number of selected households  
Which meant that the eligible households are chosen based on the number of housing units to be distributed. The quantity of houses should be equal to or more than the number of chosen households.
- Matching principle between the housing location and individual's intention in terms of residence  
In accordance to the anticipation of qualifying people in terms of the residential location, they are firstly entered in the lottery for the targeted community. Families who are not successful have the right to participate in a random arrangement by government in the residual available housing stock.
- Priority principle  
Households with harsh living conditions (*Te Kun Hu*), who are authorized with certificates by the GCAB (Guangzhou Civil Affair Bureau), can enjoy priority in obtaining social housing. Then, the low-income household that accepts monetary subsidies for leasing a house in the market also has preference in housing allocation. In addition, households with physically reduced mobility (1–3 degree or severe degree) or visual impairment have priority to obtaining dwellings on the lower floors or with elevators.
- Matching principle of household members and dwelling type  
One- or two-member households are matched to one-bedroom apartments. Three- or four-member households are matched to two-bedroom apartments. Households with more than five members are matched to three-bedroom apartments.
- Random principle  
To allocate dwellings by way of a random lottery in each category (e.g. one community).

In the light of six principles, the procedure for housing distribution operates in terms of three steps. In the first round, according to confirmed qualification by GCAB through the various stages of qualification, the housing office of GBLHA gives households with special difficulties a chance on residence to receive housing stocks directly. This step uses the priority principle for securing lowest-income families. The second step uses the grading principle. In terms of grading rules, families with more severe housing problems get higher scores. The housing office ranks a certain number of applicants from top to bottom according to the number of available houses. The rest of applicants will stay on the waiting list until the next allocation. Then entering the third step: lottery distribution. This process implements the principles of priority, matching of household members to dwelling type, matching of living intention and housing location. In preparing for lottery, all shortlisted families are classified into several groups by family structure, intended location and physical mobility. Disabled families have priority on obtaining housing on the lower floors or near elevators. Then lottery methods are used to decide the house location for each family. Unsuccessful families have a second opportunity to obtain housing, lottery method will be used again for distributing residual houses to the remaining shortlisted families.

#### 4.4.5 Management and housing withdrawal mechanism

In Guangzhou, the detailed regulations for LRH, PRH and EAH were formulated in 2007 and perfected in 2010 (The Guangzhou Office of Housing Security, 2010a). A series of leading policies of ministries (The Constructive Ministry, The National Council of Developing & Reforming et al., 2007; The Constructive Ministry, 2007; The Constructive Ministry, The National Council of Developing & Reforming et al., 2010) at national level have given references to the management in Guangzhou.

LRH and PRH use a leasing mode to guarantee housing demands. Insured families are tenants and local government is the proprietor who has the responsibility for housing regulation and maintenance. Formal management has been

perfected at neighbourhood level where the qualification of residents and their behaviour is supervised using the administration of punishment. Secured households are regulated by local administration along with clauses of a point-deduction system. According to the severity of any irregularities and speculations detailed, clients may get a warning or be punished by the deducting of points. With respect to very severe illegal matters, government will withdraw the housing contract and cancel qualification.

As to EAH and PCH, the type social housing where housing is purchased, local government regulates the transferral of ownership process. First the five years when living in EAH, households only have the right to use. Selling or reading in the market during this time are totally forbidden. Therefore, government control at this time refers mainly to supervising the residential behaviour of these households. If any illegal behaviour is noticed during this period, the local government can withdraw the right of the household to use EAH.

### Sub conclusion

The policies related to the operative procedure for social housing system can be mainly classified into four groups: targeted group, entry examination, distribution principles and withdrawal mechanism. In order to understand the acceptance of these policies, we have investigated the opinions of 660 residents who were living in social housing communities.

To summarize the results shown in Tab. 4.3, the degree of satisfaction with targeted group and examination is higher than the degree satisfaction with distribution principles and withdrawal mechanism. There are several thresholds for the targeted group such as HUKOU restriction, the upper limit on household assets and income. The percentage of positive answers, that is, reasonable and very reasonable, reached 80.2%, 84.5% and 80.9% in the categories of HUKOU, asset limit and income limit respectively. In particular, the percentages in the category “very reasonable” reached 41.0%, 10.4% and 37.4%. These are very similar to the percentages in the “reasonable” category. Moreover, only 10.2%, 3.2% and 5.5% of 658 respondents evaluated these requirements negatively, as unreasonable or very unreasonable. An overwhelming proportion of positive answers indicates that most of residents largely accept the defined targeted groups. Similarly, in total 79.4% of respondents thought the principles used in the entry examination are reasonable or very reasonable, and only 4.6% of them responded that they are “unreasonable” and “very unreasonable”.

Next, satisfaction towards the distribution principles and withdrawal mechanism show a slight decrease. No big difference is shown in the ratio of positive answers “reasonable” and “very reasonable”. In total, 78.6%, 80.1% and 78.7% respondents positively accept the principles of rating, lottery and considering personal preferences. However, the percentage of people who strongly agreed with these principles amounted only to 29.8%, 27.4% and 29.5%. The results of the withdrawal mechanism are similar with 32.8% of the people thinking that the policy is very reasonable.

**Tab. 4.3 Acceptance of 658 social housing residents of rules about allocation and management, Guangzhou**

Policies	Targeted group						Examination		Distributive principles						Total			
	With local HUKOU		Asset limit		Income limit		Public supervision		Rating principle		Lottery		Considering preferences			Return & withdraw		
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%		abs.	%	
Very unreasonable	12	1.8	2	0.3	3	0.5	1	0.2	2	0.3	5	0.8	5	0.8	7	1.1	12	1.8
Unreasonable	55	8.4	19	2.9	33	5.0	29	4.4	17	2.6	56	8.5	13	2.0	49	7.4	55	8.4
Normal	63	9.6	81	12.3	90	13.7	105	16.0	122	18.5	136	20.7	122	18.5	113	17.2	63	9.6
Reasonable	258	39.2	290	44.1	286	43.5	303	46.0	321	48.8	281	42.7	324	49.2	273	41.5	258	39.2
Very reasonable	270	41.0	266	40.4	246	37.4	220	33.4	196	29.8	180	27.4	194	29.5	216	32.8	270	41.0
<b>Total</b>	<b>658</b>	<b>100</b>	<b>658</b>	<b>100</b>	<b>658</b>	<b>100</b>	<b>658</b>	<b>100</b>	<b>658</b>	<b>100</b>	<b>658</b>	<b>100</b>	<b>658</b>	<b>100</b>	<b>658</b>	<b>100</b>	<b>658</b>	<b>100</b>

Source: own draft. Data source: 660 questionnaires in 13 communities (2 missing), Question C1-C8. Surveyed in 9.2013 and 9. 2014.

To compare the proportion of negative answers, we find the percentages of the categories “HUKOU”, “lottery” and “withdrawal mechanism” are higher than the rest. Respectively, 10.2%, 9.3% and 8.5% interviewees hold an opinion of unreasonable and very reasonable towards these rules. In the rest of the five policy categories, the percentages of people who gave negative answers stands at 3.1%, 5.5%, 4.6%, 2.9% and 2.8%.

In terms of the investigated results, the viewpoints of the surveyed people towards the current regulations may provide some indication of how to modify the policy model. Overall, these policies are highly accepted by residents. However,



some adjustment to the HUKOU limitation may improve the satisfaction. In further allocations, government should consider to what degree restraints of the HUKOU system should be released. Nevertheless, the procedure of lottery and housing withdrawal obtained comparable high proportions of disagreement. This result may imply that more attention is needed on refining the details of the two processes.

#### 4.5 Layout and location principles of social housing in Guangzhou

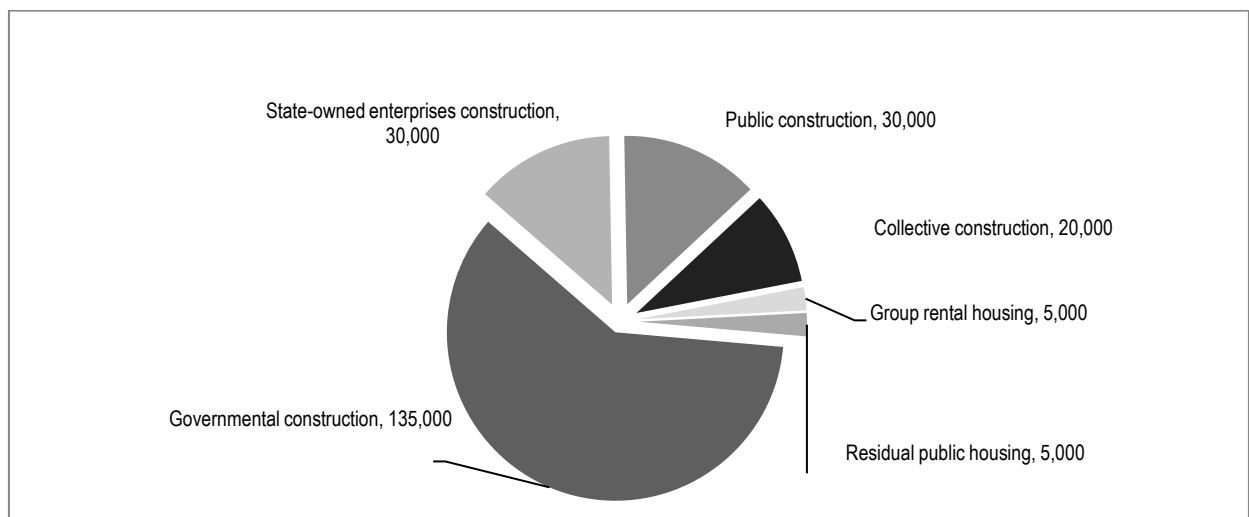
The process of the land reservation and location project determines the distribution of social housing in the urban space. A good location not only contributes to convenient daily life for residents, but also positively influences the social integration of residents. For potential homebuyers, the determinant factor of purchasing preference is the physical conditions of the neighbourhood. They particularly emphasise the accessibility of services, traffic convenience and security (Wang & Li, 2006). These facts indicate the importance of the location to the development of the community. The potential risks like residential segregation of a social housing community is supposed to be closely related to the location of arranged land parcels. Therefore, structured principles about selecting land parcels and establishing supporting services significantly affect the residential experience and community development.

From 2009, the local government started to conduct a land reservation process (The Guangzhou Government, 2009). Then the housing office of GBLH established principles for organizing the land supply (The Housing Office of Guangzhou Bureau of Land Resource and Housing, 2012). In following section, we will elaborate on the master principles, the detailed principles and others that function in the current system.

##### 4.5.1 The layout of social housing projects

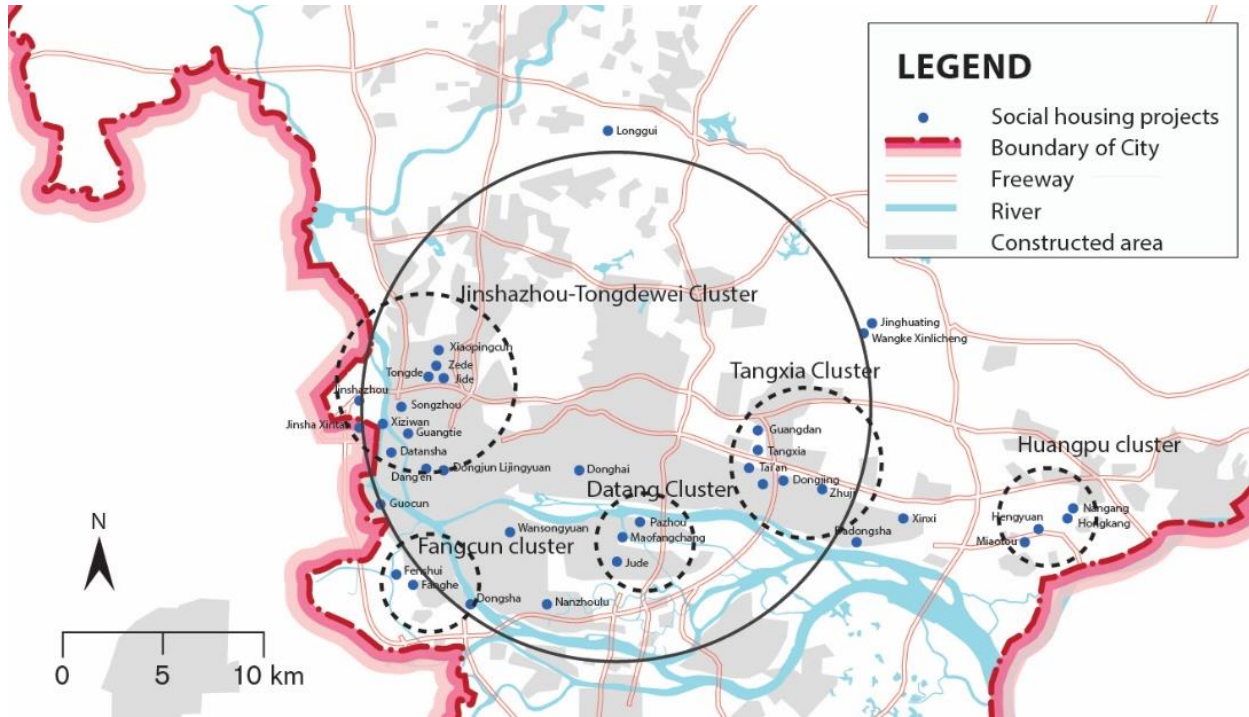
Before analysing the location of social housing, we firstly state the source of these dwellings. There are six ways to develop social housing stocks in Guangzhou. Among them, governmental construction is the dominant method for supplying dwellings (see Fig. 4.8). According to summarized data of the GBLH, local government has constructed 135,000 dwellings, which takes up 60% in the total amount. In addition, state-owned enterprises, public organizations, and collectives are also providers, having built 30,000, 30,000, and 20,000 houses respectively. Then, a small amount of social housing has been obtained from the original public housing and rental housing.

In the urban area of Guangzhou, local government has located dozens of social housing projects, completed or under construction. To observe the location and agglomeration (see Fig. 4.9), we present a summary of the following features of the spatial layout.



**Fig. 4.8 The sources of social housing stocks in Guangzhou, 2010–2015**

Source: data from Guangzhou Bureau of land resource and housing, May 2014.



**Fig. 4.9 Spatial layout of social housing projects in Guangzhou**

Source: Own draft, according to document 'The plan of land reserve for social housing in Guangzhou'. Guangzhou Bureau of Land Resource and Housing, 2014.

**Concentration on the urban fringe.** Thirty land parcels of 491.48 hectare (4.91 km<sup>2</sup>) in total, were developed for social housing construction during 2009–2010. Most of projects are concentrated in the northern and eastern urban fringe area along with the direction of urban spatial extension. Thirty-seven per cent of reserved land parcels are located in eastern Tianhe district, 23% in northern Baiyun, 16% in southern Panyu district and 14% in north-eastern Luogang district; only 2% and 1% lies in central Liwan and Haizhu where they have been well fabricated (The Guangzhou Office of Housing Security, 2012). Owing to lack of space in the districts of Liwan, Yuexiu and Haizhu in the old city area for construction, the small area and accordingly high cost of land have restricted possibilities for land reservation for social housing projects. Therefore, the land area for social housing construction in these three districts occupies only 0.16 km<sup>2</sup>.

**Scattered and local concentrated layout.** As we can see from Fig. 4.9, social housing projects are arranged into several clusters which are spatially distant. One large cluster is Jinshazhou-Tongdewei, which lies in northern Baiyun district along the border line. Some large scale communities, like Jinshazhou, Jide and Zede, are concentrated here. Another large cluster (Tangxia cluster) located in the east contains some large-scale projects like Tangde, Guangdan, Tai'an and Anxia. In addition to these two developed areas, there are two centrally located clusters which are built on a smaller scale. They are placed in the west in the Fangcun cluster in Liwan district and the Datang cluster in Haizhu district. Nevertheless, several new projects have launch in an area even further from the city like in the far north Longgui and the far east Huangpu. In general, projects are scattered in different suburban areas with long distances between them, but they are regionally grouped.

#### 4.5.2 Principles for land reservation and location

The layout of social housing relies on the location of the land parcels. Lagging land reservation has resulted in a shortage in the provision of feasible land parcels for immediate social housing construction. The mechanism of land reservation started after 2010, much later than the beginning of the social housing project. Consequently, recently reserved land parcels are mostly located far from the city centre and only suitable for middle- or long-term exploitation. These land parcels lack public transportation and supporting facilities and are away from areas with development plans.

To build social housing where it is inconsistent with urban development may lead to increased costs of construction and social segregation after use.

In order to ensure the efficiency of land supply, the GBLH housing office has established principles for managing land provision and location. Master principles aim to guide overall layout consistent with the direction of urban spatial development. Detailed principles focus on spatial arrangement within the selected area to improve the residential experience and include distance to public transport and access to public services. Our purpose in this study is to understand the location of social housing at city level. Hence, the focus here is on master principles for land reservation, which may have an influence on the urban layout.

The prime principle requires that land reservation for social housing matches strategic urban development and the spatial distribution of industries. Therefore, reservation prioritizes land parcels on the downtown fringe and proximate areas of towns and industrial zones which have been constructed with well-functioning services. Meanwhile, land parcels with better facilities and transport connections are also prioritized. Then land reservation expands to include land with low-cost, large-scale residential usage.

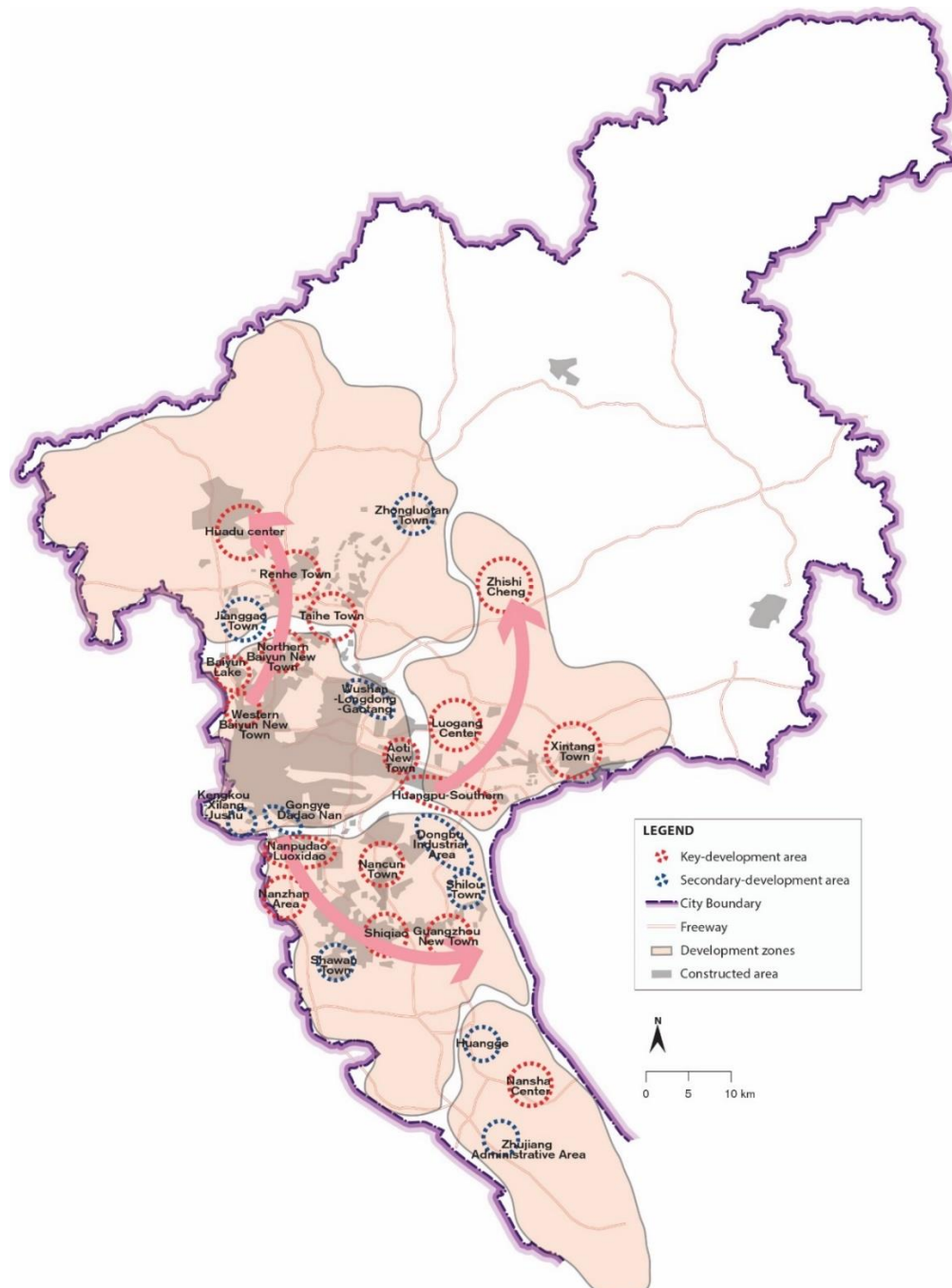
Operation coincides with the key idea put forward in “Strategic Plan on Guangzhou Urban Development” and “Master Urban Planning of Guangzhou (2010-2020)”: to expand the southern area, to modify the north, to develop the east, to connect the west and to adapt in central area. Moreover, according to the location and support services of targeted areas, reserved land is classified into key areas and secondary areas. In further construction, local government will firstly consider using key areas. The consequences of combining urban development and the primary principles for land reservation of selected land parcels for social housing construction are shown in Fig. 4.10.

1) Because of the superb transport system and ample services in the city centre, the ideal choice is to locate social housing projects on the rim of the city centre. The advantage of spatial proximity to the central area is well-constructed physical services, which saves added cost for supporting facilities. In addition, residents of social housing are close to a well-developed socioeconomic environment. Local government attempts to collect land parcels through “Urban Renewal Projects” (*San Jiu Gai Zao*) and “Adjusting Industrial Structure Projects” (*Tui Er Jin San*). The centrally located key areas for social housing contain four projects: Baiyun Lake, northern and western Baiyun new town, and Aoti new town. The first three lie on the north-eastern fringe and the other lies on the eastern periphery. Along the rim of the central development zone, the southern and north-eastern areas have been designed as secondary areas for construction. These contain the Kengkou-Xilang-Jushu project in Liwan district, the Gongye Dadao Nan project in Haizhu district, and the Wushan-Longdong-Gaotang project in Tianhe district.

2) The eastern development zone functions as the secondary centre for creative industries. Land provision mainly targets the housing needs of technicians and young talents artists. From the map (Fig. 4.10), we can see the intensive construction in Tianhe and Luogang district, these key developing areas form a belt across the north and east of the outer city. These projects located in the east are characterized by oriental industry. Luogang centre and Zhishi Cheng are new areas in which creative industries are concentrated, and Xintang town is a secondary industry-driven area.

3) In the northern zone, planned lands are developing from the edge of the central area to the centre of Huadu district. The belt extends to the north through several town centres: Taihe town, Renhe town and Huadu centre.

4) In zone in the southern area, the reservation plan has been implemented in the administrative centres or industrial areas. Prioritized land parcels for developing social housing in Panyu district, are characterized by a pleasant residential environment and a good transport service. These include Shiqiao, Nanpudao-Luoxidao, Nanzhan area, Nancun town and Guangzhou new town. In addition, places like the Songbu industrial area, Shilou town and Shawan town are involved in reservation as well. Local government also structures land reservation in the remote Nansha district. These are mainly situated in central area or sub central areas.



**Fig. 4.10 Reserved land parcels for social housing, Guangzhou**

Source: Own draft, according to document “the plan on land reserve for indemnificatory housing of Guangzhou”. Guangzhou bureau of land resource and housing, 2012.

### Sub-conclusion

Through an overall view of the locations of developed projects and the principles of land reservation, we can recognize the configuration of the social housing model in city Guangzhou. Recently developed projects are scattered on the fringe of the central development zone. With time, land on the periphery of the city centre has been mostly occupied, and there is no more possibility of reserving it for the needs of social housing construction. Therefore, reserved land parcels are generally concentrated in the administrative centres or industrial centres of remote districts. As a consequence, future layout of social housing will be more dispersed and decentralized, but more concentrated in sub centres of Guangzhou city.

## 5 Study area, data and methods

### 5.1 Study area

#### 5.1.1 Background knowledge of Guangzhou

Guangzhou is the commercial and cultural administrative centre of south China (Fisher 1962: 253). The city is also known as Canton, established during the Qin dynasty (around 206 BC). In 1949, Guangzhou was the capital city of Guangdong province. During the post-reform period after 1978, its advantageous location benefited the city as the south gate of China for economic and cultural exchange. Owing to the importance of its location in the Pearl-River Delta (PRD) and great political support from national government, Guangzhou has attracted large investment from overseas as well as advanced technics for industries. The coexistence of opportunity and challenge has greatly transformed the social structure and spatial configuration (French, 1979; Wu 1999: 377). In 2014, the ranking system proposed for global cities by A.T. Kearney ranked Guangzhou at 52 (Beijing ranked at 12; Shanghai ranked at 20).

**Geographic environment.** The location of the Guangzhou provides primary conditions for functioning as the core city in the PRD. Guangzhou lies in middle of the southern part of Guangdong province, the administrative region of which stretches over 7,434.4 square kilometres with a population of over 12.70 million (The sixth census of Guangzhou 2010: 1-01). The East River, North River and West River converge into the main stream of the Pearl River, which flows through Guangzhou.



**Fig. 5.1** Location of Guangzhou in Guangdong province

Source: own draft, map database: [www.zwbk.org](http://www.zwbk.org) 2015.

In the north the city connects to Qingyuan city and Shaoguan city, in the west it connects to Foshan, in the south to Dongguan and Zhongshan and is also located close to Shenzhen (the city defined as the special economic development zone). Hong Kong and Macao lie across the sea (see Fig. 5.1). The advantageous geographic location makes



Guangzhou a junction between the mainland and overseas. Its location at the origin of two axes (Guangzhou-Shenzhen-Hong Kong and Guangzhou-Zhuhai-Macao) increased its chances to obtaining capital, high-tech and industry from Hong Kong and Macao. In the meantime, the city has spread resources to the northern area to lead regional development. Typical projects are planned for the Guang-Fo metropolis area and the metropolis areas of PRD. Importantly, regional development initially benefited from the central location. Guangzhou city contains 12 districts. Among them, ten city-level districts are Yuexiu, Liwan, Haizhu, Tianhe, Baiyun, Tianhe, Huangpu, Panyu, Huadu and Nansha, and the two county-level districts are Conghua and Zengcheng. The first seven city-level districts form the main urban district (see Fig. 5.2), which is the main region of our research.



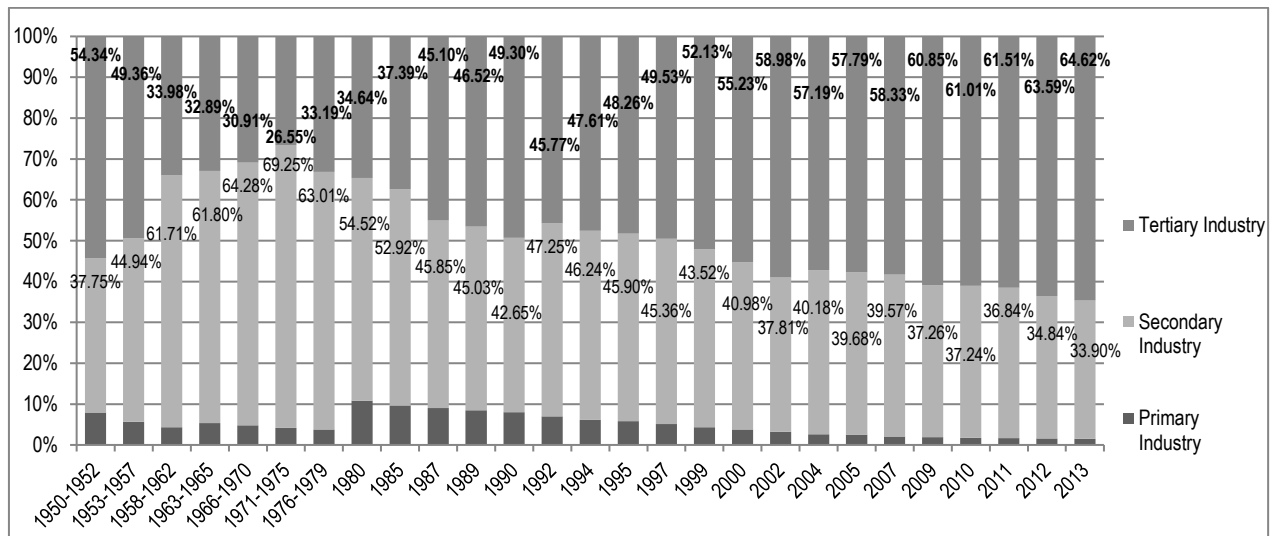
**Fig. 5.2 Location of Guangzhou administrative area**

Source: Xu & Yeh 2013, adaption: L. Baumann. 2015.

**Political impact.** As it is a Chinese city, the national polity decides that its development, either industrialization or urbanization, is strongly linked to political status and related operations. During the period of the planning economy (1949–1978), when central government conducted intensive city development, Guangzhou had abandoned overseas commercial trade that was formed autonomously. Additionally, the remote location also resulted in little investment from the state on local industrial development. The city centre was only slightly developed, and slow industrial progress had

not resulted in any significant expansion of the urban space. With the formulation of the Open Door policy in 1978, its coastal location contributed to converting Guangzhou into a unique field for testing the market economy. The state revitalized the marketing economy by means of a series of policies. In the following decade, Guangzhou recovered its commercial activity by improving trade through the port and tertiary development.

The impact of the opening policy was profound; not only was the economic structure reformed, but the flow of immigration also increased significantly. The year 1978 is a critical turning point in industry structure. As shown in Fig. 5.3, the share of secondary industry was a dominant part of the Guangzhou economy, the share of which had kept growing up to 69.25% by 1975. After 1978, this proportion began to drop. By 1979, it was 63.01%, and continued to drop to 33.9% in 2013. Conversely, the share of the tertiary sector demonstrated stable growth after 1978, which rose from a local low of 26.55% to 33.19% by 1979 and kept growing to 64.62% in 2013. Meanwhile, the policy also brought enormous immigration flows. By 1975, the net growth ratio of the population was 3.01% and even at a minus level before. The rate increased sharply to 11.56% in 1978 and 22.97% in 1980 (Statistic Year Book of Guangzhou, Guangzhou 50 years: Tab. 2-4 Immigration of main years). After the short boom, the rate fell back to 11.7% in 1985 and 2.74% in 1990.



**Fig. 5.3 The Industrial structure of Guangzhou since 1949**

Source: own calculation, database: Guangzhou 50 years & Statistic Year Book of Guangzhou 2014.

Urban planning, a policy-related operation, has reorganized the spatial layout of Guangzhou. Certain events occurred in Guangzhou, like 14th master plan in 1984 and the sixth National Games of 1987, which provided favourable opportunities for the local authority to arrange spatial functions. A new central business district (CBD) was constructed in Tianhe district, the Guangzhou Economic and Technological Development Zone was established in eastern, and infrastructure and amenities were improved in the port area to attract foreign investment. However, the city centre area was overcrowded because of urbanization (Xu & Yeh 2003: 365), which shed light on the necessity for intensive land use. Then, the local government introduced the land reform policy in 1987, which aimed to reorganize the city centre area and to improve land use on the periphery. This policy essentially changed the Guangzhou urban landscape. Secondary industries moved to peripheral areas and downtown started to function as the commercial and business centre. Afterwards, "The Fifteenth Master Plan" of mid 1990s further strengthened the central position of Guangzhou in South China as the commercial, business and administrative hub.

From end of the 1990s, competition from Shanghai and neighbouring cities like Shenzhen, Zhuhai and Dongguan challenged the status of Guangzhou in the region as well as in China. Local government put forward some ambitious goals and named the city with several meaningless statuses. After this clumsy time, certain new development

strategies<sup>10</sup> proposed the development of Guangzhou as a regional central city and a liveable city. Subsequent adjustments shifted the city to become the hub of the metropolis area, where it functions to connect neighbouring cities for regional cooperation. At this moment, a multi-centre industrial structure forms the city area, and special zones for the development of various industries (e.g. secondary industry, high-tech industry, commercial business, administration, ecology and residence) have been formed as well. The operation at the political aspects and their implications alert us to the significance of policy in city development. As the main actor in the political system, local government not only directs the economic and industrial structure, but also acts as the dominant force in readjusting urban space by means of urban planning and strategy design to promote urban development (Wong, Tang, Horen 2006: 646).

**Economic development.** Currently, Guangzhou is the commercial, business and trade centre of PRD. The city has experienced rapid economic development over the past three decades. During the economic reform of 1978, Guangzhou was prioritized to revitalize its economic system. Different to previous endogenous dynamics, the economy after the 1980s was greatly stimulated by foreign investment and the import and export trade. By way of constructing infrastructure and amenities in the city centre and constructing the south port, the city has attracted enormous foreign investment. These measures have contributed to a proliferation of secondary and tertiary industries.

With access to the World Trade Organization (WTO) and the sovereign return of Hong Kong and Macao, neighbouring cities within the PRD started catching up in terms of economic development. Surrounded cities made efforts to build economic relationships with progressive zones like Hong Kong, Macao, Shenzhen and Zhuhai. This development of the surrounding area has decreased the preferential situation of Guangzhou. The intensive competition changed the status of Guangzhou into a centre for leading regional cooperation rather its prior position as attracting investments (Wong 2005: 307; Xu & Yeh 2003: 361). Through cooperation a multiple industrial structure has been established instead of a system that depends on external investment.

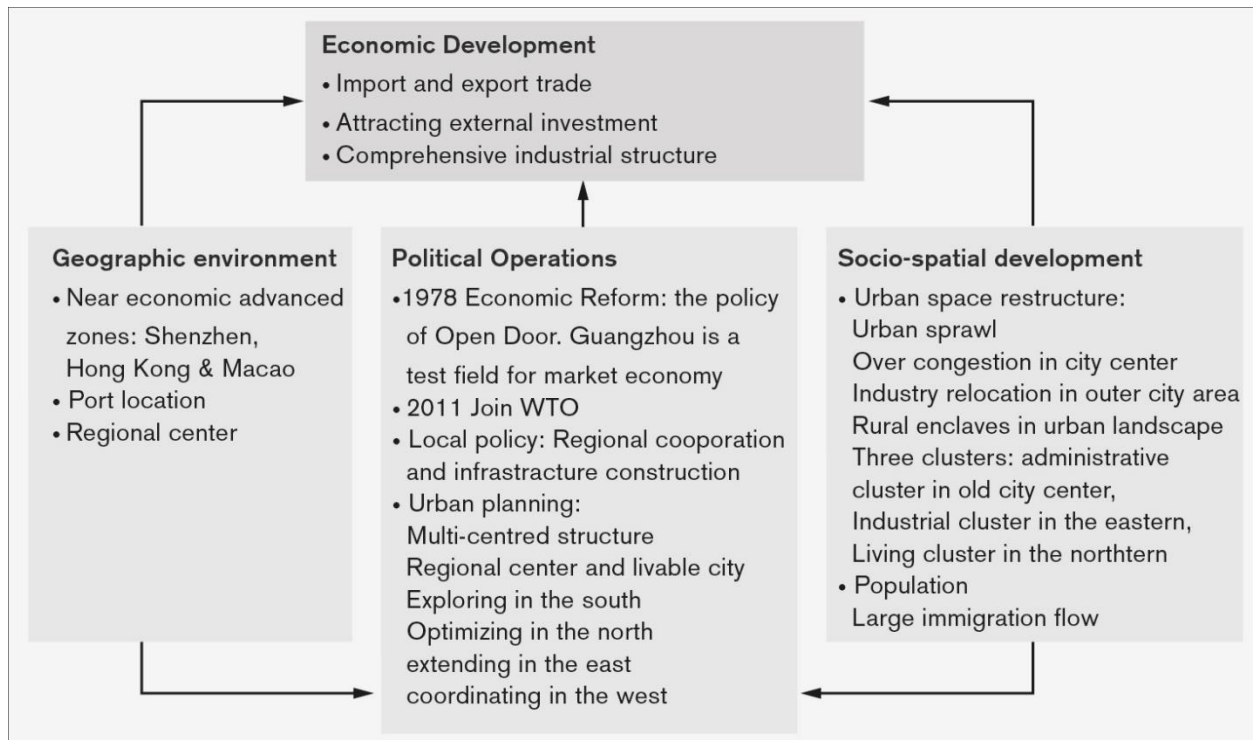
**Socio-spatial development.** The huge transformations, such as spatial restructuring and population immigration, are the consequences of political support and economic development (Yu & Ng, 2007: 96). In central-control polity, the influence of policy on urban society and space is much more powerful than its functions in other polities (see Fig. 5.4). In addition, Guangzhou symbolizes how a coastal city may be transformed under the political direction. Just as Vogel (1989) mentioned that Guangdong province is one step ahead of China, Guangzhou is the city that is one step ahead in Guangdong.

During the pre-reform time of 1949–1978, the city centre area showed little growth. Closed economic policy limited the performance of the market system, which was revived with the Open Door policy. The economic boom rapidly gave rise to problems in the city centre area, such as high population density, urban space congestion, land insufficiency and pollution. At this time, the peripheral land of the inner city was used for industrial construction. Hence, urban progress was predominantly directed by economic planning (Xu & Yeh 2003: 364).

From the mid-1980s, urban planning started to affect socio-spatial development. The 14th Master Plan for housing and land reform in the late 1980s and the 15th Master Plan in the mid-1990s enlarged the built-up area and reorganized the city centre with more space for infrastructure. With industries moving to the edge, more city areas were available for building various facilities. The city generally formed three functional zones: the city centre zone for political, economic and cultural development; the northern zone for residences and environmentally-friendly industries; and the eastern zone for industries and port transport. However, rapid urban sprawl has taken over much farmland and rural land, and has formed an enclave landscape of rural residential land in the urban fabric of Guangzhou.

<sup>10</sup> Strategies includes 1) three-phase urban development strategy from end 1990s: minor changes in the years 1998 and 1999, medium change in three years 1999–2002 and major change in 2010. 2) The new spatial development in 2003: expansion in the south, optimization in the north, advancement in the east and linkage in the west (Wong, Tang, Horen 2006: 646).

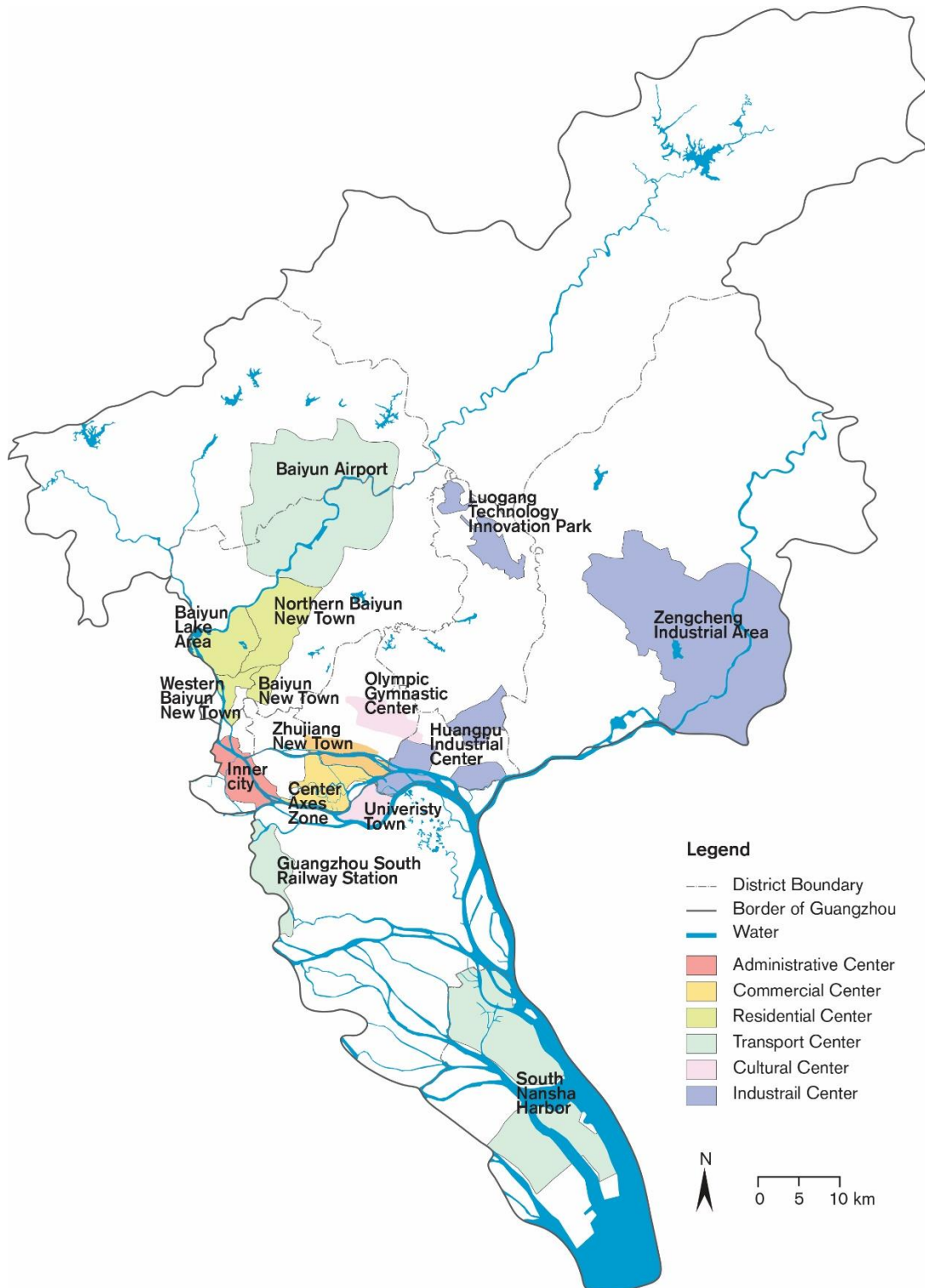




**Fig. 5.4 The background to development in Guangzhou, after 1978**

Source: own draft. Adaption: L, Baumann. 2015.

To find an appropriate spatial structure to match city development is particularly significant for Guangzhou. The plan in 2003 proposed a multi-centred spatial development. The strategy planned to arrange urban space consistent with functional zones. As shown in Fig. 5.4, zones for technical industry and culture concentrate in Bio-island, University Town and the Olympic Gymnastic Centre. Administrative centres are concentrated in the old city of Yuexiu and Liwan districts. Commercial and financial centres expand along the axes of the city centre and Zhujiang new town. Industrial centres are Huangpu-Luogang industrial zone, Zengcheng manufactory cluster and Luogang technology innovation park. Transport hubs and logistics centres are located at the northern Baiyun airport, southern Nansha harbour and the south railway station. Main residential centres are Baiyun new town, and ecological areas that are scattered in Baiyun district, Zengcheng and Huadu district (The Master Design of Guangzhou 2010-2020). Recent arrangements reiterate the idea of the city as a liveable city and the regional centre for administration and economy.



**Fig. 5.5 The functional zones of Guangzhou**

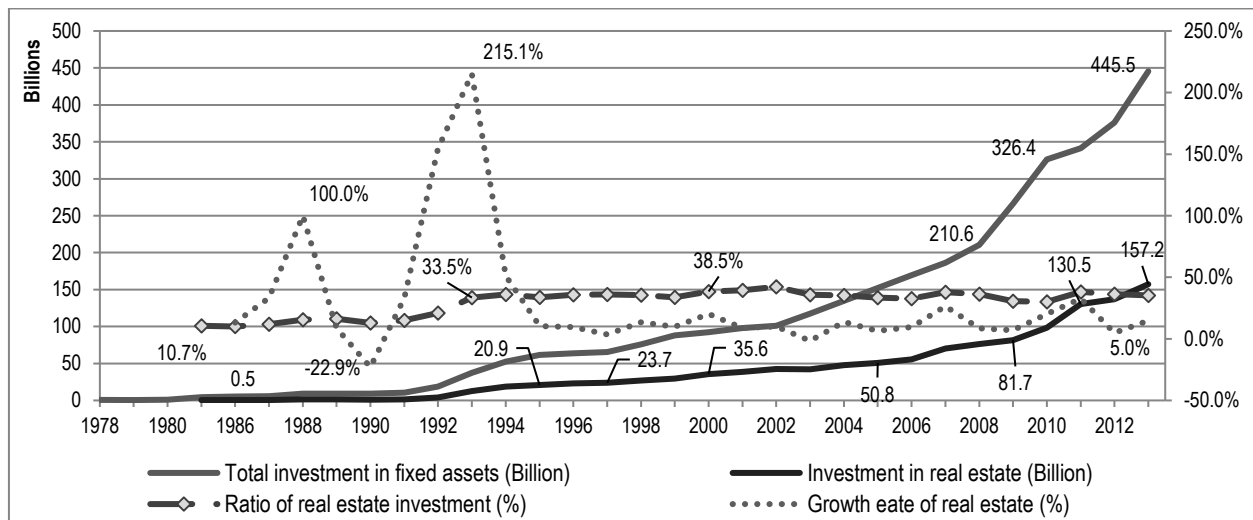
Source: database. The industry spatial distribution of Guangzhou master design in 2010-2020, Guangzhou Bureau of Urban Planning, 2012; Adaption: R. CHAO, 2015.

### 5.1.2 Overview of living conditions in Guangzhou

Housing demands have exerted intense pressure on urban development in Guangzhou. The rapid urban development has brought a substantial flow of immigration from proximate regions. While the huge population movement injected

abundant labour forces into Guangzhou city, it also exerted urgent pressure on the organization of residential spaces. In addition, the collapse of state-owned enterprises and deindustrialization resulted in a great decline in the former welfare housing system (He 2010: 671).

From the 14th Master Plan in 1984, the Guangzhou government began to deliberate the arrangement of residential land, and several new housing projects have been established on residential land on the fringe of the city centre. The urban sprawl of Guangzhou was in line with continuous planning after 1990, the city has greatly enlarged and the additional space that is available is provided for urban construction. In order to drive progress, local government attempted to use market mechanisms to accelerate urban construction. By selling or renting out urban land to enterprises in the market, many buildings and amenities have been established. This action successfully drove the development of the real estate market (see Fig. 5.6). From 1979, the real estate market demonstrated a gradual increase. Two surges occurred, 1985-1989 and 1990-1995. During these periods, the growth rate rose dramatically, reach the peaks 100.0% and 215.1% in 1988 and in 1993 respectively. Following these two highs, the annually increasing rate fluctuated at levels between 10 and 20%. The amount of investment in real estate maintains a steadily rising trend. After the two highs, the amount reached 20.9 billion yuan in 1995. By 2013, investment increased to 157.24 billion. At the same time, the share of investment in real estate in total on city fixed assets presented notable growth during 1985–1995. The ratio rose from 10.7 to 33.5%, and maintained this level after 1995.



**Fig. 5.6 Investment and growth in real estate in Guangzhou, 1978–2012**

Source: data source: Statistic Year Book of Guangzhou, 2014, Tab. 4-5 Total Investment in Fixed Assets in Main Years (by type of investment).

However, the rapid growth in the real estate market resulted in a series of negative issues for the housing system, like excessive market housing prices, imbalanced supply–demand structure, discordant relations between the rental housing market and retail housing market (Guo, 2010: 4-5). The price of land led to the high prices of market housing, which were largely out of reach in terms of affordability for the majority of residents. According to studies by the World Bank, the income–house ratio of developed countries should remain between 1.8:1.55, and 1.3:1.6 in developing countries (Guo, 2010: 7). Based on statistical data for 2014, the average level is over 1:5; in metropolises like Beijing, Shanghai and Tianjin rates are even higher to 1:11, 1:9 and 1:7 respectively (see Tab. 5.1). Although we lack city-level data for Guangzhou, its status as the third biggest metropolis in China may imply a huge gap between the high housing price and affordability. Moreover, plenty of residential buildings are completed in a style that is removed from liveable dwellings for low- and middle-income families. This issue has decreased opportunities for participation in the housing market among economically weak citizens in market. In 2000, per capita living space of Guangzhou was 13.13 m<sup>2</sup>, higher than Beijing, Shanghai and Tianjin. The cities were at equal level in 2005, but by 2012, the level of Guangzhou was 22.5 m<sup>2</sup>, dropping to last place in comparison to over 30 m<sup>2</sup> in other cities (see Tab. 5.2). Guangzhou urgently needs an effective system to fulfil demands for suitable housing by middle- and low-income people.

The social housing system of Guangzhou started in 1986 and has experienced several periods during which various housing types were developed. The city was a pioneer in this project in China. With many efforts, Guangzhou has obtained significant outcomes. From 2000 to 2010, the increasing rate of social housing in Guangdong was also ranked at the top level with Beijing, Fujian and Jiangxi (see Fig. 5.7). As Xinjiang and Tibet are remotely located provinces in large scale, their very high increasing rates would be hard to compare with most provinces. The national sixth census also indicates this noticeable result. Guangdong province has produced 152,911 units of social housing, of which 80,670 have been completed in Guangzhou city (Social Housing Office of Guangzhou, 2012). This number is far beyond the results of other provinces and municipalities (e.g. 41,767 in Beijing, 14,449 in Tianjin, 19,128 in Shanghai and 42,444 in Chongqing) (see Tab. 5.3). Along with the outcomes of social housing construction, local government also confronts issues, such as the shortage and remote location of available land parcels. The process of the social housing system in Guangzhou represents the general situation in big cities with urgent housing needs. Taking Guangzhou as the case study is helpful to understand the progress, problems and implications. To learn its experiences would be very important for bringing about an effective social housing system in the various regions of China.

**Tab. 5.1 The ratio of yearly income to house price, by administrative level of province, 2013**

Region	Average selling price of commercial buildings (yuan/sq. m)	Total price of 70 m <sup>2</sup> commercial buildings (yuan)	Annual per capita disposable income (yuan)	Average yearly income of 3-member family (yuan)	Income-house Ratio
Beijing	18,553	1,298,710	40321.0	120963.0	1:11
Shanghai	16,420	1,149,400	43851.4	131554.1	1:9
Hainan	8,669	606,830	22928.9	68786.7	1:9
Tianjin	8,746	612,220	32293.6	96880.7	1:7
Zhejiang	11,042	772,940	37850.8	113552.5	1:7
Fujian	9,050	633,500	30816.4	92449.1	1:7
Guangdong	9,090	636,300	33090.0	99270.1	1:6
Jiangxi	5,203	364,210	21872.7	65618.0	1:6
Heilongjiang	4,738	331,660	19597.0	58790.9	1:6
Sichuan	5,498	384,860	22367.6	67102.9	1:6
Chongqing	5,569	389,830	25216.1	75648.4	1:5
Hebei	4,897	342,790	22580.3	67741.0	1:5
Shanxi	4,433	310,310	22455.6	67366.9	1:5
Liaoning	5,122	358,540	25578.2	76734.5	1:5
Jilin	4,483	313,810	22274.6	66823.8	1:5
Jiangsu	6,909	483,630	32537.5	97612.6	1:5
Anhui	5,080	355,600	23114.2	69342.6	1:5
Henan	4,205	294,350	22398.0	67194.1	1:5
Hubei	5,266	368,620	22906.4	68719.3	1:5
Hunan	4,243	297,010	23414.0	70242.0	1:5
Guangxi	4,593	321,510	23305.4	69916.1	1:5
Guizhou	4,295	300,650	20667.1	62001.2	1:5
Yunnan	4,494	314,580	23235.5	69706.6	1:5
Tibet	4,174	292,180	20023.4	60070.1	1:5
Shaanxi	5,280	369,600	22858.4	68575.1	1:5
Gansu	3,886	272,020	18964.8	56894.3	1:5
Qinghai	4,163	291,410	19498.5	58495.6	1:5
Ningxia	4,232	296,240	21833.3	65500.0	1:5
Xinjiang	4,268	298,760	19873.8	59621.3	1:5
Shandong	5,049	353,430	28264.1	84792.3	1:4
Inner Mongolia	4,301	301,070	25496.7	76490.0	1:4

Note: The income-house ratio makes use of the quotient of "Average yearly income of 3-member family" to "Total price of 70 m<sup>2</sup> commercial buildings". Source: China Statistic Year Book, 2014.

Tab. 5.2 Average per capita living space of 2000, 2005 and 2012, by cities (unit: sq. m)

City	2000	2005 <sup>e</sup>	2012 <sup>f</sup>	City	2000	2005 <sup>e</sup>	2012 <sup>f</sup>
Beijing	11.14 <sup>a</sup>	19.50	29.26	Guangzhou	13.13 <sup>d</sup>	19.10	22.50
Shanghai	11.03 <sup>c</sup>	15.50	33.90	Shenzhen		19.00	27.90
Tianjin	8.90 <sup>b</sup>	24.20	30.00	Haizhou		21.50	29.80
Ningbo		24.92	35.00	Changchun		18.93	29.20
Hangzhou		20.75	34.30	Nanchang		20.82	29.04
Wuhan		20.66	33.50	Taiyuan		18.44	29.00
Xiamen		23.00	33.40	Hefei		18.39	28.80
Xi'an		16.38	33.00	Dalian		17.58	27.30
Chengdu		20.38	32.90	Haerbin		19.00	27.00
Fuzhou		19.18	32.10	Xining		19.50	25.80
Huhe Haote		21.00	31.50	Lanzhou		16.71	25.40
Zhengzhou		20.82	31.00	Guiyang		16.28	22.70
<b>Average</b>		<b>26.11</b>	<b>32.91</b>				

Source: data source: <sup>a</sup>Beijing Statistic Year Book. (2001): Tab. 18-2: Residential Conditions of Urban Residents. <sup>b</sup>Tianjin Statistic Year Book. (2001): Tab. 5-3. The Floor Space of Urban Housing. <sup>c</sup>Shanghai Statistic Year Book. (2001): 6. Per Capita Living Space of City Area p. 90.

<sup>d</sup> Statistic Year Book of Guangzhou. (2001): Tab. 9-6. The Floor Space of Urban Residents in Main Years. <sup>e</sup><sup>f</sup> Zhang, Y. (2015): Tab. 1. Per Capital Living Space of Cities: p. 63.

Tab. 5.3 The number of households in each province in 2010, by housing type

Region	Low-rent Housing	Affordable Housing	Privatized Public Housing	Market-rental Housing	Market Housing	Self-built Housing	Second-hand Housing	Other	Total
Beijing	9,586	32,181	115,100	213,902	118,548	108,408	20,620	36,833	655,178
Tianjin	8,147	6,302	32,719	70,260	90,153	107,398	16,545	24,344	355,868
Shanghai	16,628	2,500	115,758	304,306	203,534	98,049	49,492	20,217	810,484
<b>Guangdong</b>	<b>127,443</b>	<b>25,468</b>	<b>107,347</b>	<b>682,379</b>	<b>354,479</b>	<b>1,256,720</b>	<b>52,593</b>	<b>100,990</b>	<b>2,707,419</b>
Chongqing	9,649	32,795	42,101	83,652	145,774	539,648	24,801	23,789	902,209

Note: The data were selected from several regions that are similar with Guangdong in terms of economic and political status.

Source: The sixth census of China, Tab 9-4 The number of households of regions by housing source, 2010.



Fig. 5.7 The increasing rate of social housing 2000–2010, by province

Source: own draft, 2015. Data source: the fifth and sixth census of China 2010, map database: GOOGLE ERATH.

### 5.1.3 The 13 social housing communities surveyed

#### 5.1.3.1 Research area and layout of social housing projects

The administrative area of Guangzhou has changed several times.<sup>11</sup> In the field surveys conducted in year of 2013 and 2014, we select the administrative division of 2010, which is also used in the sixth census. By this time, Guangzhou consisted of ten districts and two town-level cities. Liwan, Yuexiu and Haizhu are three old districts, seven outer city districts are Tianhe, Huangpu, Baiyun, Luogang, Panyu, Huadu and Nansha, and two town-level cities are Zengcheng and Conghua. As commonly defined, inner city refers to the north Liwan district (old Dongshan district), the Yuexiu district and the northwestern Haizhu district. The outer city area of Guangzhou consists of the left -hand side of Haizhu district, south west Tianhe district, Huangpu district, south Baiyun district and Luogang district (see Fig. 5.8).

According to the location of the social housing projects, this study mainly focuses on the seven centrally located districts of Guangzhou: Liwan, Yuexiu, Haizhu, Baiyun, Tianhe, Huangpu and Luogang (see Fig. 5.8). By 2014, in total 52 social housing projects have been established in Guangzhou city, of these 20 completed projects had been distributed to people (see Tab. 5.4). Aside from one unfinished project located in Panyu district, all the rest of them are located in these seven districts. Different goals in each period and limited land provision and urban planning jointly affect the scale, location and mix type of social housing projects. This study selected 12 completed social housing projects and one transferred social housing project as cases.

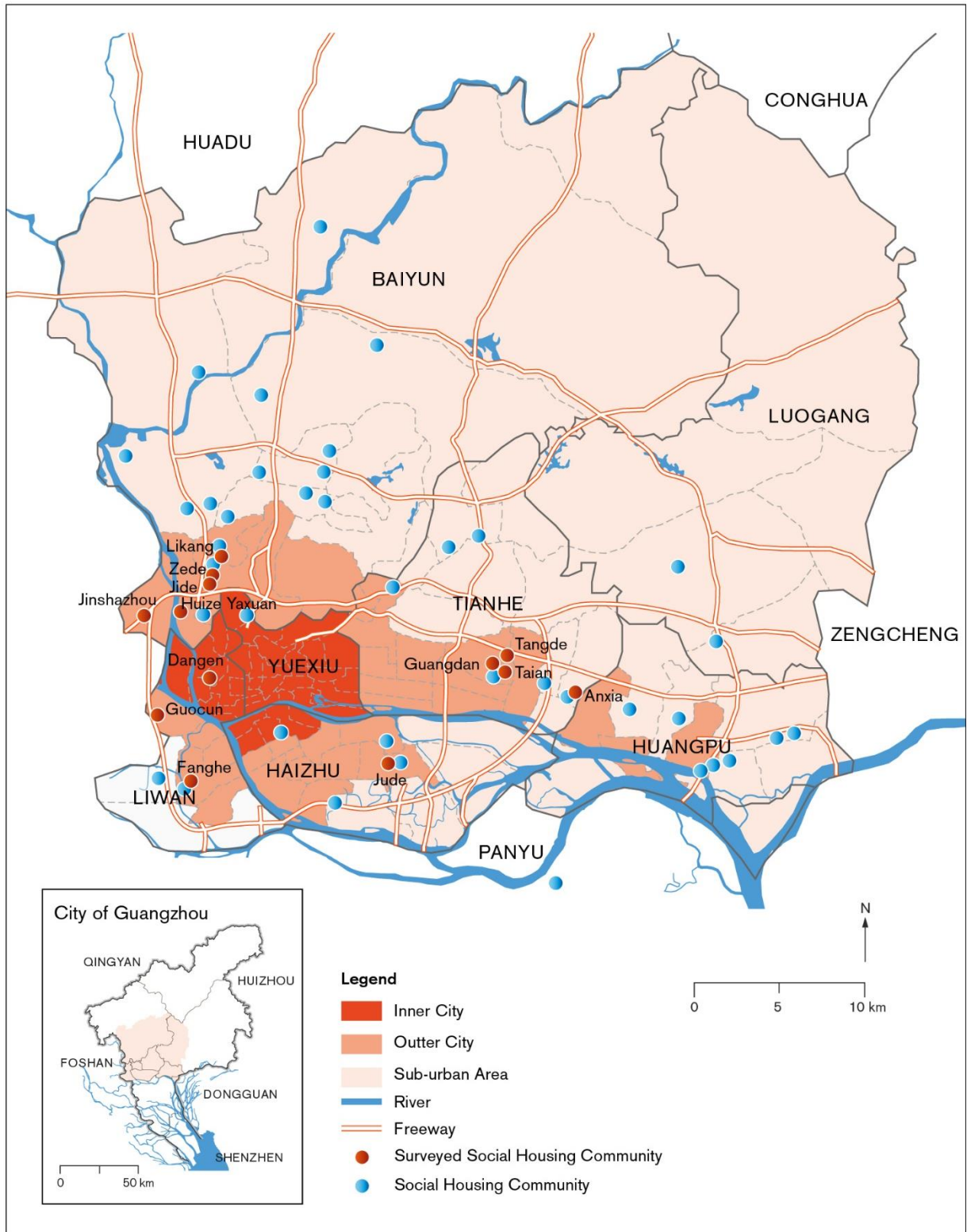
Zede, Tangde and Jude are the three oldest social housing projects, which were extended again after 2000. Therefore, housing encompassed was JIEKUN & ANJU housing, low-rent housing (LRH) and economically affordable housing (EAH). Three communities are on a huge scale and house lowest-income and low-income inhabitants, firstly functioning to reduce inner city poverty caused by deindustrialization.

From 2005, the second turn in social housing construction started. LRH and EAH became the two dominant housing types. The former uses a rental format to benefit low-income families, while latter functions in a retail form for meeting the demands of middle- and low-income families. Jinshazhou, Fanghe and Guangdan are three typical large-scale projects that were built during this time; and Jide, Anxia, Tai'an and Guocun are four small-scale projects with around 1,000 dwellings. In contrast to these projects that contain both types of LRH and EAH, Dang'en and Huize Yaxuan are two small communities with a single affordable housing type.

Likang is not a newly built project, but one of transferred communities from the public housing system. In Guangzhou, in total eight social housing communities are in this situation (see Tab. 5.4). In the period of housing reform after 1998, local government privatized some public housing (*Gongzu Fang*) and sold ownership to internal employees at a low price. Their original welfare purpose was similar to social housing projects, so the public housing was emerged into the model of social housing. In comparison with constructed social housing projects, transferred housing has a far fewer restrictions and private owners can trade them in the market. Due to the similarities of these communities in terms of location and scale, this study selected one of them to represent all of them.

<sup>11</sup> In 2000, Panyu and Huadu city merged into Guangzhou city as two administrative districts. In 2005, Dongshan district and Yuexiu district joined as new Yuexiu district, Fangcun district combined into Liwan district. The last change occurred in 2014, Zengcheng city and Conghua city redefined as two districts of Guangzhou (Yuan and Wu, 2014).





**Fig. 5.8 Study area and location of 13 surveyed social housing communities**

Source: Own draft, 2014. Map database: Yuan, Y. & Wu, F. 2014.

Tab. 5.4 List of social housing projects in Guangzhou, by end of 2013

Phase of construction		Name of Projects	
Before 1998	JIEKUN & ANJU	Built-up	Zede, Tangde, Jude
2008-2010	EAH & LRH dominant	Built-up	Jinshahou, Fanghe, Jide, Guangdan, Tai'an, Anxia, Guocun, Dang'en, Huize Yaxuan
		Transferred <sup>a</sup>	Likang, Jixian, Yulong, Yunquan, Yunshan, Yunning, Fangyuan, Tianya
		Under construction	Wansong, Datian, Nanyue, Miaohe, Hengyuan, Ruidong, Rongyue, Tangxia, Tongde, Longgui Project, Xiaopingcun Project, Maofangchang Project, Nanzhouli Project, Zhuji Project, Nanfang Gangchang Project, Miaotou Project
After 2010	Multi-level provision	Under construction	Xinshi Project, Yeliangchang Project, Baoli Project, Huangjinwei Project, Luogang Project, Jiahe Lianbian Project, Tongdewei Project, Panyu Xinzao Project, Dongxin Project, Yagang Project, Shifenglu Project, Dongfeng Xinjie Project, Boluoshan Project, Renhe Project, Tianlunan Project, E'zhangtan Project

Notes: <sup>a</sup> Transferred communities, also referred to as "transferred teacher's houses", were public housing owned by local government. They were firstly used as public housing for teachers, and then government privatized the ownership and sold them to residents in low prices after the housing reform of 1998. Source: Guangzhou Bureau of Land Resource and Housing, 2013.

### 5.1.3.2 Details of 13 selected social housing communities

#### Communities located in western Liwan district

*Fanghe Community.* Fanghe is a newly built large-scale social housing community in Liwan district. It lies on the northern part of the arterial road "Longxi Dadao" (see Fig. 5.9). Within the community, separate buildings for LRH and EAH characterize the internal spatial layout. The community comprises 19 buildings (with 24–32 floors), two buildings in the north are mainly for LRH (1,947 units) and other buildings are used for EAH (3,988 units). Although they are semi-mixed (in same community and in different buildings), there are no partitions between the buildings to separate the public space. All residents in the community share the entertainment amenities and lawns. Fanghe has one kindergarten, one primary school, one basic medical facility, sport amenities, commercial facilities and a comprehensive service centre. The community is more favoured by middle- and low-income groups because of the good location, convenient transport connections and well-equipped facilities. We administered 100 questionnaires in Fanghe and the sampling ratio was 1.68%.

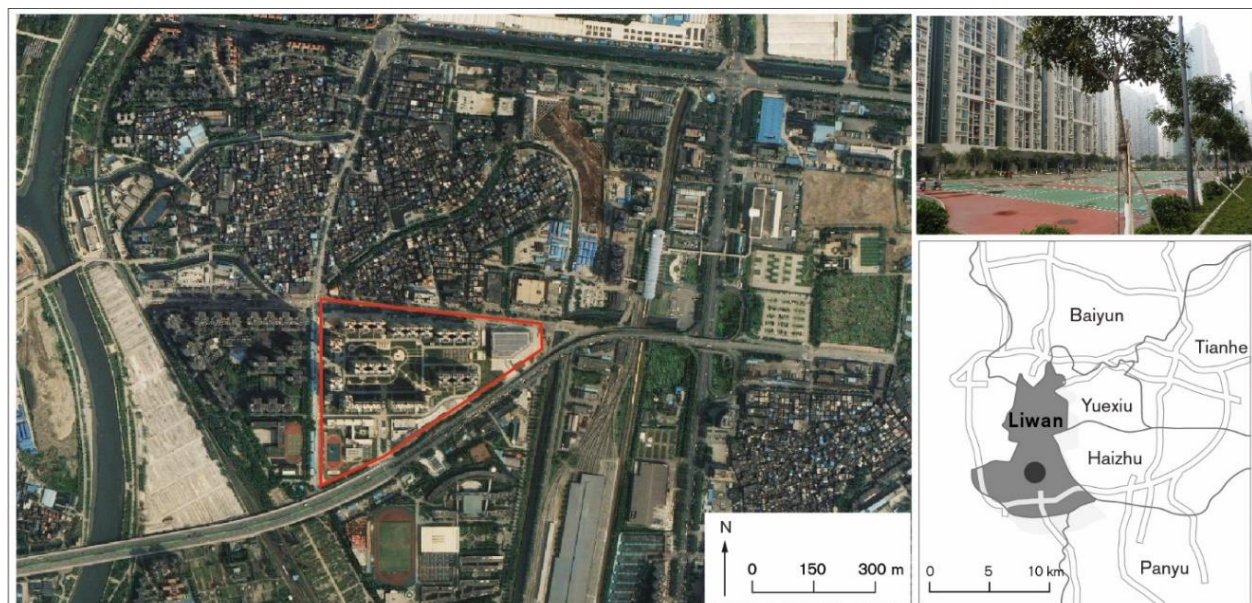


Fig. 5.9 Satellite view of Fanghe community

Source: map database: BAIDU map, adaptation: R. CHAO, 2015. Photo was taken by R. CHAO, 2013.

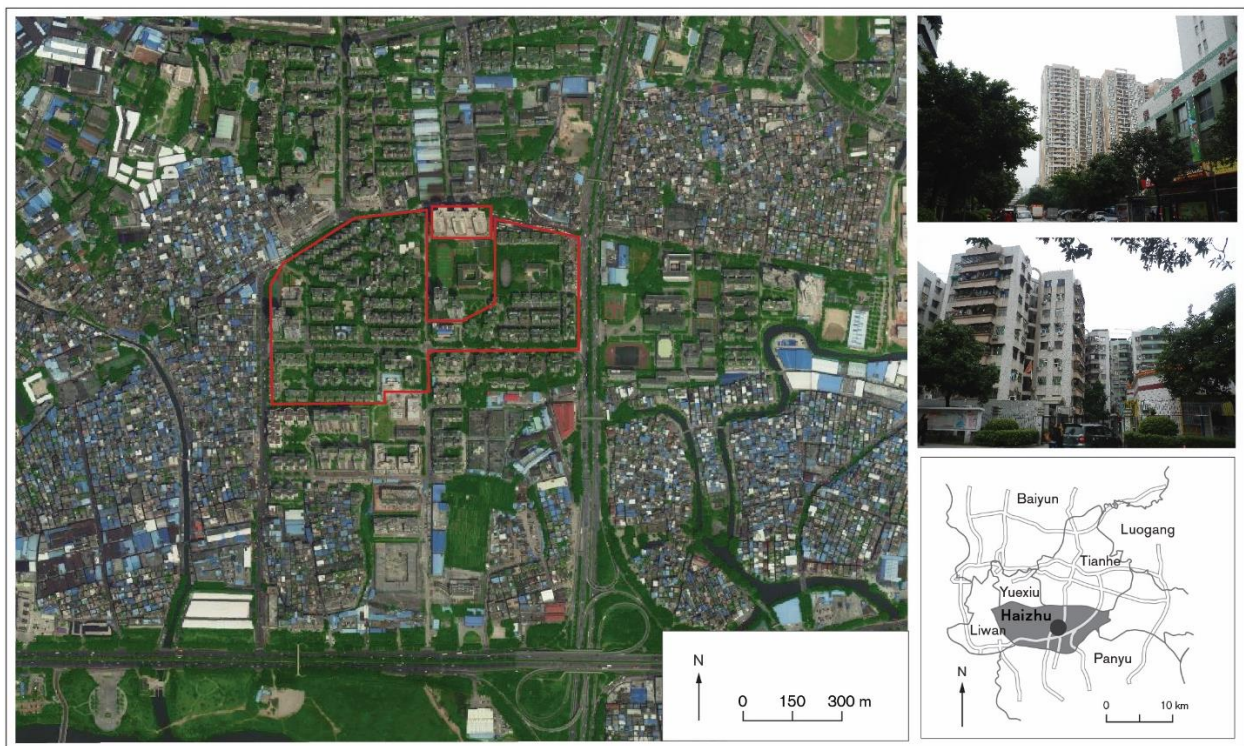
*Guocun Community.* Guocun is a small community in Liwan district. This project was completed in 2009, and contains 365 units of EAH and 564 units of LRH. We interviewed 20 people in the survey.



*Dang'en Community.* Dang'en was constructed in Liwan district in 2009. Dang'en is a small community with 512 households of EAH. Compared to most social housing projects, it enjoys a favourable location close to the city centre. No specific education or medical services have been constructed within the community. Residents in Dang'en use the facilities in the immediate area. In total 20 persons were interviewed in our study and the sampling ratio was 3.9%.

### Community located in the Haizhu district

*Jude Community.* Jude is situated in the Datang sub-district of Haizhu district. It is the one of three earliest social housing communities built. The good location in the inner city area greatly benefits residents relating access to various services (see Fig. 5.10). Jude has experienced three phases of construction. In phase I, approximately 1,000 JIEKUN & ANJU housing were completed here. Then, 911 units of LRH and 844 EAH were built in Phase II and Phase III. The different types of dwelling constructed in Phase I (1998) and Phase II (2008) are fully mixed without specific geographical borders. Phase III is located on a separate area, which provides EAH only for residents. Facilities in Jude are well developed, with one primary school, one sanitary station, commercial services, a community cultural centre and so on. We interviewed 100 people here and the sampling ratio was 0.25%.



**Fig. 5.10** Satellite view of Jude community

Source: map database: BAIDU map, adaptation: R. CHAO, 2015. Photos were taken by R. CHAO, 2013.

### Communities located in eastern Tianhe district

*Tangde Community.* Tangde, lies in Tangxia village, Tianhe district, is one of three earliest social housing communities that were built. To the north the community lies adjacent to important city arterials: Guangyuan freeway and Guangzhou-Shenzhen railway (see Fig. 5.11). The southern part of the community was firstly built in Phase I for JIEKUN & ANJU project. This area contains 4748 units of housing, among which over 3000 households have been traded in the retail market, making it more like a market housing community. Following, a total 900 units of both LRH and EAH were constructed in the north-western area of Tangde from 2005. In 2011, government launched the third project in the north-eastern area with over 3500 units of LRH.

Over the past 20 years, Tangde has developed an effective system with supporting facilities. Within the community, there are four kindergartens, two primary schools, one middle school, commercial facilities like markets and supermarkets, a basic medical facility, a police station, a cultural centre and a post office. Several bus stations are

scattered around the community, which provide very convenient transport services. Tangde is a typical social housing community with excellent neighbourhood management. We conducted 100 questionnaires in September 2013, with a sample ratio of 1.00%.



**Fig. 5.11** Satellite view of Tangde, Guangdan and Tai'an community

Source: map database: BAIDU map, adaptation: R. CHAO, 2015. Photos of Tangde Community and Tai'an Community were taken by R. CHAO, 2013; photo of Guangdan Community was taken by V. MAUER, 2018.

*Guangdan Community.* Guangdan is located in Tianhe district and is spatially close to Tangde community (see Fig. 5.11). The community was put into use from 2011. It possesses 12 high-rise buildings (23–25 floors), in which 1790 units are LRH and 2656 units are EAH. Buildings are geographically separated into the two kinds of social housing. Guangdan provides one kindergarten, one primary school, a market, sports amenities, a cultural centre and so on. We surveyed 20 people with a sampling ratio of 0.45%.

*Tai'an Community.* Tai'an is situated in Tianhe district, next to the Tangde social housing community (see Fig. 5.10). This project is a small community with 675 units of housing which were completed in 2009. Two hundred and twenty-five units of low-rent housing and 450 units of affordable housing are separated in different buildings. This study interviewed 20 people in September 2013.

*Anxia Community.* Anxia is a middle-sized social housing community, and lies in eastern Tianhe district neighbouring to Tangde community. Anxia is a special kind of middle-sized community with one type of social housing – EAH (2113 units). Twenty residents were interviewed with a sampling ratio of 0.95%.

### Communities located in northern Baiyun district

*Zede Community.* Zede is located in the Tongde sub district, in the southwest of Baiyun district. It is one of the three earliest communities of a large size to be built (see Fig. 5.12). Zede west is connected to the urban arterial, Xicha Street, which lies south of the inner circle of Guangzhou. Xicha Street is one of three north–south arterials of the city; it plays an important role in freight transport and passenger transport. The heavy traffic creates serious traffic jams especially during rush hour. Up to now, Zede has provided over 7000 units of social housing, of which 3256 are LRH, 670 are EAH and 1859 are JIEKUN & ANJU housing. Government launched the Zede project in 1998, and it has been enlarged twice in 2008 and 2010 respectively. The dwellings built in 1998 developed JIEKUN & ANJU housing, aimed to address the urgent lack of housing for laid-off workers and the unemployed during the course of deindustrialization. Phase I is spatially separated from Phase II and Phase III by Zede Street. The majority of JIEKUN & ANJU housing of



Phase I have been transferred in the retail market, so the area of Phase I is mostly a market housing community. The second phase of construction began from 2005, when government extended the community and constructed LRH & EAH to address the housing problems of low-income families. Buildings developed during this time make use of a mixed dwelling mode, which means residents of LRH and EAH are totally mixed. They share one building and live next door to each other – no inner spatial boundaries exist. Government attempts to create more opportunities for communication by spatial proximity, which may be efficient in terms of countering social segregation. However, because of differences in living habits and life values between the two kinds of resident, this fully mixed living form has given rise to several issues for sanitary and security management.

Zede is a typical large-scale social housing community with over 20 years of history. Compared to newly built projects, it has an effectively developed facility system. One kindergarten, one primary school, one middle school, a clinic, and a commercial building (includes market, supermarket) are provided within the community, and four bus stations lie around community. Of the three old social housing communities (Tangde, Jude & Zede), Zede is situated furthest from the inner city. The relatively remote location leads to more transport problems for residents which will be difficult to solve in the short term. It was considered worthwhile selecting Zede as a case to explore the development of social housing community and to understand the impacts caused by the location and the mixed dwelling mode. We interviewed 100 inhabitants in Sep 2013, giving a sampling ratio of 1.74%.

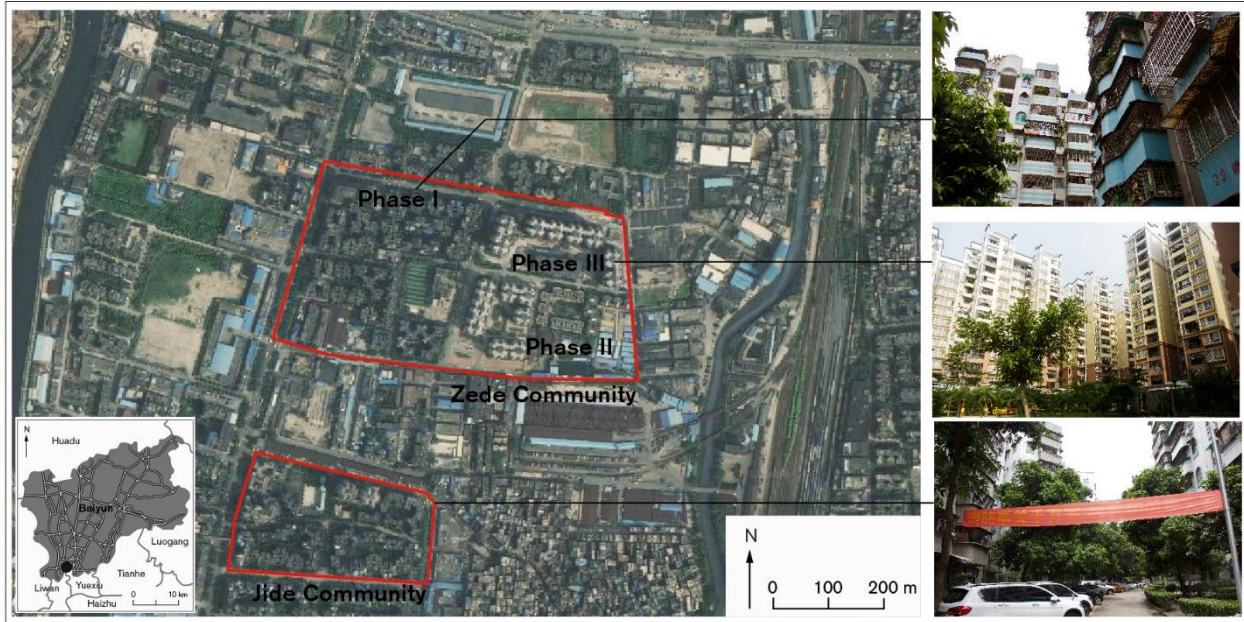
*Jide Community.* Jide is located in Tongde sub district, Baiyun district, which is spatially close to Zede community (see Fig. 5.12). It is also next to the city's arterial road, Xicha Street. Similar to Zede district, traffic congestion in Xicha Street greatly impedes residents' travel. In total, Jide contains 2520 units of housing, of which over 2000 units are JIEKUN & ANJU housing. Only a handful of dwellings are LRH and EAH and most of ANJU housing had been passed on to private individuals in housing market. Consequently, the average income level of residents here may be higher than the level of the other communities. Jide has only one primary school. This study administered 20 questionnaires in this community with a sampling ratio of 1.14%.

*Jinshazhou Community.* Jinshazhou is the representative project of social housing construction in the LRH & EAH dominant period after 2005. In total, Jinshazhou contains 3555 low-rent housing units and 1670 affordable housing units. At one time, it was the largest social housing community, and lies in the north-western corner of Baiyun district (see Fig. 5.13). The location brings serious transport problems. Some residents take over 1.5 hours for a single commute. This difficulty has led to broad criticism of the disadvantageous selection of its spatial location and lack of transport facilities in the social housing community. The community is divided into four sections from north to south. Sectors I, II & IV mainly consist of LRH and sector III particularly provides for EAH. Inner roads between the four sections function as borderlines, which spatially separate the inhabitants of LRH and EAH. The partition avoids the contradictions to some degree but also decreases communicative opportunities.

Jinshazhou has well-designed buildings, housing patterns and amenities. It includes two kindergartens, one primary school, one middle school, a market, clinics, a police station and a community activity centre. In addition, government has built a new metro station on the west side of the community, making Jinshazhou the only social housing community with a metro station. This study interviewed 100 inhabitants, and the sampling ratio is 1.92%.

*Huize Yaxuan Community.* Huize Yaxuan is a small social housing project in Baiyun district. It was built in 2011 with 426 EAH units for middle- and low-income families. The study administered 20 questionnaires and the sampling ratio is 4.6%.

*Likang Community.* Likang is a small-size community (166 households) that lies in Baiyun district. Dwellings in Likang were transferred from public housing. The government sold these to middle- and low-income families at a low price, and recently included them in the EAH model. Thus, people in Likang possess whole ownership of the housing and any legal trade in the retail market is allowed. In total, eight social housing communities in Guangzhou were sampled in this way. Since they are similar in size, location and housing history, we selected 20 people in Likang as participants in our interviews. There are no educational institutions in the community. Residents share supporting facilities like primary schools and markets with neighbouring areas.



**Fig. 5.12 Satellite view of Zede and Jide community**

Source: map database: BAIDU map, adaptation: R. CHAO, 2015. Photo database : photos of Zede community was taken by R. CHAO, 2013; photo of Jide Community was taken by V. MAUER, 2018.



**Fig. 5.13 Satellite view of Jinshazhou community**

Source: map database: BAIDU map, adaptation: R. CHAO, 2015. Photo was taken by R. CHAO, 2013.

### 5.1.3.3 Sub conclusions

Based on the information on the 13 communities, we summarized the details in Tab. 5.5, which displays location, construction, scale and dwelling type features. These factors may lead to different outcomes for management and spatial patterns. For example, communities located near the city centre may have advantages in terms of access to medical facilities and metro stations over remote communities; and older social housing communities may have easier access to commercial facilities than newer ones.

Tab. 5.5 Details of 13 social communities, Guangzhou

Name	Allocated time	Location	Guaranteed households				Mixed mode	Surveyed quantity	Sampling proportion
			LRH <sup>a</sup>	EAH <sup>b</sup>	ANJU				
Fanghe	9/2010	Dongjiao street Liwan district	5935	1947	3988	/	<b>Semi-mixed</b> - 19 buildings, 6 LRH and 13 EAH - No internal partition between buildings - Sharing public space of community	100	1.7%
Guocun	1/2009	Fangcun Xixing street Liwan district	929	365	564	/	<b>Semi-mixed</b> - Residents of LRH and those of EAH are living in separated buildings - No internal partition between buildings - Sharing public space of community	20	2.2%
Dang'en	1/2009	Dang'en street Liwan district	512	/	512	/	<b>Single type</b> - All buildings are EAH	20	3.9%
Jude	1998 11/2008 10/2009	Chigang road Haizhu district	2691	911	844	936	<b>Fully mixed</b> - The community has three subdivisions which are separated by roads. - One sector was built with ANJU housing and small number of scattered apartments used as LRH and EAH. - Buildings of second sector are used as LRH and EAH which are mixed totally. Part of apartments in one building are used as LRH and others used as EAH - Buildings of third area are only provided to EAH residents.	100	3.7%
Tangde	1998 11/2008	Tangde street Tianhe district	2649	897	4	1748	<b>Fully mixed</b> - South part of community was built with ANJU housing. - In residential buildings of north part, two type housing mix totally. Some apartments of a building are allocated to EAH residents and some to LRH residents	100	3.8%
Guangdan	9/2011 7/2012	Chebei street Tianhe district	4446	1790	2656	/	<b>Semi-mixed</b> - Residents of LRH and those of EAH are living in separated buildings - No internal partition between buildings - Sharing public space of community	20	0.4%
Tai'an	1/2009	Chebei street Tianhe district	675	225	450	/	<b>Semi-mixed</b> - Residents of LRH and those of EAH are living in separated buildings - No internal partition between buildings - Sharing public space of community	20	3.0%
Anxia	9/2011	Zhongshan street Tianhe district	2113	/	2113	/	<b>Single type</b> - All buildings are EAH	20	0.9%
Zede	1998 11/2008 7/2010 7/2012	Xicha street Baiyun district	5758	3256	670	1859	<b>Fully mixed</b> - The community includes three spatial sections. Three areas are separated by roads. - Buildings of one section was early built as ANJU housing - Buildings of another two areas are used as LRH and EAH which are mixed totally. Part of apartments in one building are used as LRH and others used as EAH	100	1.7%
Jinshazhou	1/2008	Jinshazhou street Baiyun district	5227	3555	1627	/	<b>Semi-mixed</b> - The community has 4 sections which were separated by roads. Four sections are built separately. - Buildings of three sections are used as LRH and buildings of one section are provided to EAH residents - Residents in one section are sharing greens and fitness equipment - Residents of two type of housing are sharing public resources like primary schools, activity center.	100	1.9%
Jide	1998	Xicha street Baiyun district	1747	12	15	1720	<b>Fully mixed</b> - Numbers of house in buildings are used as LRH and EAH - Various residents are mixing in residential building	20	1.1%
Huize Yaxuan	1/2011	Zengcha street Baiyun district	426	/	426	/	<b>Single type</b> - All buildings are EAH	20	4.7%
Likang	1/2008	Xicha street Baiyun district	166	/	166	/	<b>Single type</b> - All buildings are EAH	20	12.0%

Note: a) LRH is the abbreviation for "low-rent housing"; b) EAH is the abbreviation for "economically affordable housing". Source: Guangzhou Bureau of Land Resource and Housing, 2013.

Tab. 5.6 Features of the 13 social housing communities, by location, time of construction, mixed type and scale

Categories Name	Location (district)				Time of construction			Mixed mode			Scale		
	Western Liwan	Middle Haizhu	Eastern Tianhe	Northern Baiyun	1998	2008-2010	After 2010	Fully mixed <sup>a</sup>	Semi-mixed <sup>b</sup>	Single <sup>c</sup>	Big >4000	Medium 1500-3000	Small < 1500
Fanghe	√					√			√		√		
Guocun	√					√			√				√
Dang'en	√					√				√			√
Jude		√			√			√				√	
Tangde			√		√			√				√	
Guangdan			√				√		√		√		
Tai'an			√			√			√				√
Anxia			√				√			√		√	
Zede				√	√			√			√		
Jinshazhou				√		√			√		√		
Jide				√	√			√				√	
Huize Yaxuan				√			√			√			√
Likang				√		√				√			√

Note: <sup>a</sup> Fully mixed refers to three different types of household (early social housing: ANJU housing, low-rent housing and affordable housing) which are mixed in a community. <sup>b</sup> Half mixed refers to two kinds of social housing (low-rent housing and affordable housing) which are spatially integrated in the same community but located in different buildings and normally separated by paths. <sup>c</sup> Single community means small social housing community built after 2008, and this kind of community has only affordable housing. Source: own draft, 2015. Database: Guangzhou Bureau of Land Resource and Housing, January 2013.

With the purpose of finding out the effects of these factors on the accessibility of facilities, the job–housing relationship and neighbourhood integration are discussed in the following chapters. This study simplified the contents of Tab. 5.5 and regrouped 13 communities into different categories according to four characteristics: scale, time of construction, location and dwelling type (see Tab. 5.6). By exploring the intersection of the factors and the surveyed data (such as travel mode and travel time to get to facilities) from interviewees, we try to answer the question of which factor may produce significant effects on accessibility, workplace and integration.





Pho. 5.1 Traffic congestion on Xicha Street (in front of Zede community)



Pho. 5.2 Housing blocks in Zede community



Pho. 5.3 Housing blocks in Jude community (Phase I and Phase II)



Pho. 5.4 Housing blocks in Jude community (Phase III)



Pho. 5.5 Housing blocks in Fanghe community



Pho. 5.6 Internal sport area in Fanghe community

(Photo: CHAO, 2013)





Pho. 5.7 Street outside Tangde community



Pho. 5.8 Housing blocks and main path inside Tangde community



Pho. 5.9 Underground parking in Fanghe community



Pho. 5.10 Market adhere to Jide community



Pho. 5.11 Housing blocks in Jide community



Pho. 5.12 Artery streets inside Jide community

(Photo: V, MAURER, 2017)





Pho. 5.13 Huanzhousan Street (next to Jinshazhou community)

(Photo: CHAO, 2013)



Pho. 5.14 Housing blocks of Jinshazhou community



Pho. 5.15 Street next to Anxia community



Pho. 5.16 Housing blocks in Anxia community



Pho. 5.17 Sport area in Anxia community

(Photo: V, MAURER, 2017)



Pho. 5.18 The bird's-eye view on the top of housing block in Guangdan community





Pho. 5.19 Main street outside Guangdan community



Pho. 5.20 Main path inside Guangdan community



Pho. 5.21 Street outside Dang'en community



Pho. 5.22 Housing blocks in Dang'en community



Pho. 5.23 Housing blocks in Likang community



Pho. 5.24 Internal elementary school in Likang community

(Photo: V, MAURER, 2017)





Pho. 5.25 Housing blocks in Tai'an community



Pho. 5.26 Main path inside Tai'an community



Pho. 5.27 Housing blocks in Guangdan community



Pho. 5.28 Housing blocks in Dang'en community

(Photo: V, MAURER, 2017)





**Pho. 5.29 Main path inside Fanghe community**

(Photo: V, MAURER, 2017)



**Pho. 5.30 Housing blocks in Huize Yaxuan community**

## 5.2 Data sources

### 5.2.1 Literature review

A literature review is the groundwork that provides an overview of the theoretical basis and informs investigations. In chapter 2, the study summarized discussions on theoretical facts related to spatial justice, on which our research structure is established. The review covers various definitions of social justice, subsequent models of spatial justice, and the actual examination on spatial justice issues like accessibility, job–housing mismatch and cultural exclusion.

### 5.2.2 Official documents

In order to draw up a profile of the social housing system in Guangzhou, our study collected an array of policies that were proposed by ministries at different levels. As we know, the dominant role of authority in the system results in a close relationship between policy and practices during the provision of social housing. All administrations involved have a right to provide suggestions and to draft policies to drive the process. Policies emanating from central government normally focus on a master design for the goal and directions. Subsequently, policies that are released by local government concentrate on detailed matters like land reservation, housing construction, distribution and management. Therefore, policies not only structure the housing system and process, but also cover construction and management. Through cooperation with the GBLH, we have obtained abundant documented data on policies (see Appendices A.1) and the details of surveyed communities and some projects under construction. These data mainly support the descriptions in Chapters 3, 4 and 5, which have discussed the housing history, the social housing system of Guangzhou and the actors in social housing in detail.

### 5.2.3 Statistical data

Statistical data are the main source for quantitative analysis in this study. Our collection covers the annual statistics yearbook of Guangzhou since 2000, statistics for Guangzhou 50 Years (which records data from 1949–2000), the fifth census (2000) and the sixth census (2010). The statistics yearbook of Guangzhou provides overall information on the city's demographics, real estate market, housing development and social security. However, applied geographic units in statistics only provide details on districts. The lack of accuracy of the statistics yearbook prevents us from making a dynamic comparison of social housing residents. To compensate, the census data provide details on the sub district level such that the living conditions of the population for each unit are classified and summarized. Though it is hard to obtain data of communities, we can still reflect on the spatial and social environment of the nearby areas on a smaller scale. Simultaneously, the short residency duration of the targeted group in social housing results in a short time range (mainly between 2008 and 2014) for our research. In this study, we select data on population, employment ratio, occupation and social security, and analyse them using tools for quantitative and spatial analysis (e.g. Excel, ArcGIS). Summarizing and visualizing statistical data greatly contributes to forming a backdrop to the housing system as well as small-scale analyses.

**Tab. 5.7 Details of questionnaire survey**

Group	Sub group	Details - Quantity of questionnaires	Total	
Social housing community	Western cluster- Liwan	Fanghe (100), Dang'en (20), Guocun (20)	140	660
	Middle cluster- Haizhu	Jude (100)	100	
	Eastern cluster- Tianhe	Tangde (100), Tai'an (20), Guangdan(20), Anxia (20)	160	
	Northern cluster- Baiyun	Zede (99), Jinshazhou (100), Huize Yaxuan (20), Jide (20), Likang(21)	260	
Neighbor community		Chengxi - Jinshazhou(20)	20	60
		Jianzhen -Jude (20),	20	
		Fanghe –Fanghe (20)	20	

Source: based on questionnaire survey administered in August and September 2013 and September 2014.

### 5.2.4 Fieldwork

The aims of the field trips were to achieve a direct response from the current residents in social housing communities about their living conditions, social integration and potential development. Investigation made use of questionnaires and in-depth interviews. The empirical work consisted of three field trips that were organized in January of 2013, August and September of 2013 and September of 2014 respectively.

The first investigation focused on interviews, the results of which greatly supported the following design work on the formal questionnaire. Our targeted participants included policy designers in local government, managers of the social housing community, residents and researchers who are interested in related topics (see Appendices A.3). Interviews with policy designers included discussion on the principles of housing design, construction and management, and recognition on spatial justice. Interview questions for local managers covered services for the community and the inhabitant situation. Furthermore, topics with residents covered their daily behaviours in regard to commuting and accessing facilities, assessment of the justice issue, and living problems. Outcomes of interviews provided abundant material for policy analysis in Chapters 3 and 4.

Based on the work of the first survey, during the next two field trips, 660 questionnaires in total were completed in 13 social housing communities and 60 questionnaires in three neighbouring communities of Jude, Fanghe and Jinshazhou (see Tab. 5.7). Most of the work was completed in the second fieldwork and supplemented with 80 questionnaires in Jude community investigated in Sep. 2014. Questions in the survey concern employment, access to facilities, recognition of justice, neighbourhood integration, satisfaction and personal information (see Appendices A.2).

### 5.2.5 Maps

Examinations of both distribution of facilities and spatial changes of workplaces are based on map data in terms of location, area, and demographic data such social attributes. The base map was drawn in ArcGIS according to Google maps, and data about administrative boundaries and location of services was added in layers and obtained from Sun Yat-sen University. Moreover, residential location and workplace of individuals are fixed manually in terms of survey data. Subsequently, the exported map data were further improved by the mapping tool Illustrator.

## 5.3 Methodology

This research mainly explores three issues: accessibility to facilities, job–housing relationship and neighbourhood integration. The exploration operates using quantitative methods and a spatial method. Prior to these analyses, the study made use of a qualitative method to summarize information about housing history and the development of the social housing system in Guangzhou.

### 5.3.1 Qualitative analyses

This study has widely applied qualitative methods in collecting non-numerical data, reviewing the literature and constructing a theoretical framework (Chapter 2), as well as describing the housing history (Chapter 3) and the social housing system of Guangzhou (Chapter 4). The main way to conceptualize theory is theoretical analysis, which summarizes related statements for a feasible empirical structure. In describing the housing system, the database for this part was obtained mainly from documented policies and related documents, and qualitative analysis makes it possible to give a brief overview. The analysis selected some widely used ideas in policy analysis. For instance, the roles of the actors involved and the interactions between them are demonstrated by means of the actor network.

In addition, a qualitative approach was also applied in showing oral responses that were obtained from the expert interviews, which provided complementary material to the quantitative analyses. In the data collection phase, in-depth interviews with experts, policymakers, managers and residents in social housing were used, and recordings (photography, occasional talks with people living in social housing) were made during field trips. The semi-structured interview in the first field trip was a pilot test. The investigation involved structured questions and welcomed open-ended answers. This mode contributed to providing rich references as well as political material. During the three field trips, visual ethnography played a supplementary role in collecting instant information by way of note-taking and photography.

### 5.3.2 Quantitative analyses

Quantitative analysis in this research is primarily based on statistical techniques and mathematical models. Based on statistical data and questionnaire data, we used mathematical approaches like table analysis, factor analysis and binary logistic regression, on the platforms of SPSS and Excel. The first method is the table analysis, which is an essential approach runs that through our study. Measurements are calculated using numbers, frequencies and proportions of categories in a variable and results are displayed by way of tables or statistical figures. Similarly, several categorical

analyses contain two variables and are displayed by means of cross table. In accordance with the demands, the results of table analysis are also sometimes figured with functions of a “smart chart” in Excel and “graph” in SPSS. We have selected line charts (Chap.3 & Chap.5), bar charts (Chap.3), scatter-dot charts (Chap.6), spider charts and box-whisker charts (Chap.7) to highlight results. Second method is statistical analysis, which is carried out in SPSS. Questionnaire responses were entered into SPSS and each question is regarded as a variable. In order to identify the potential influence of satisfaction on accessibility to public services in Chapter 7, the study has made use of principle component analysis and regression analysis. Similarly, logistic regression was applied several times in Chapters 8 and 9 to identify the determinants of job change.

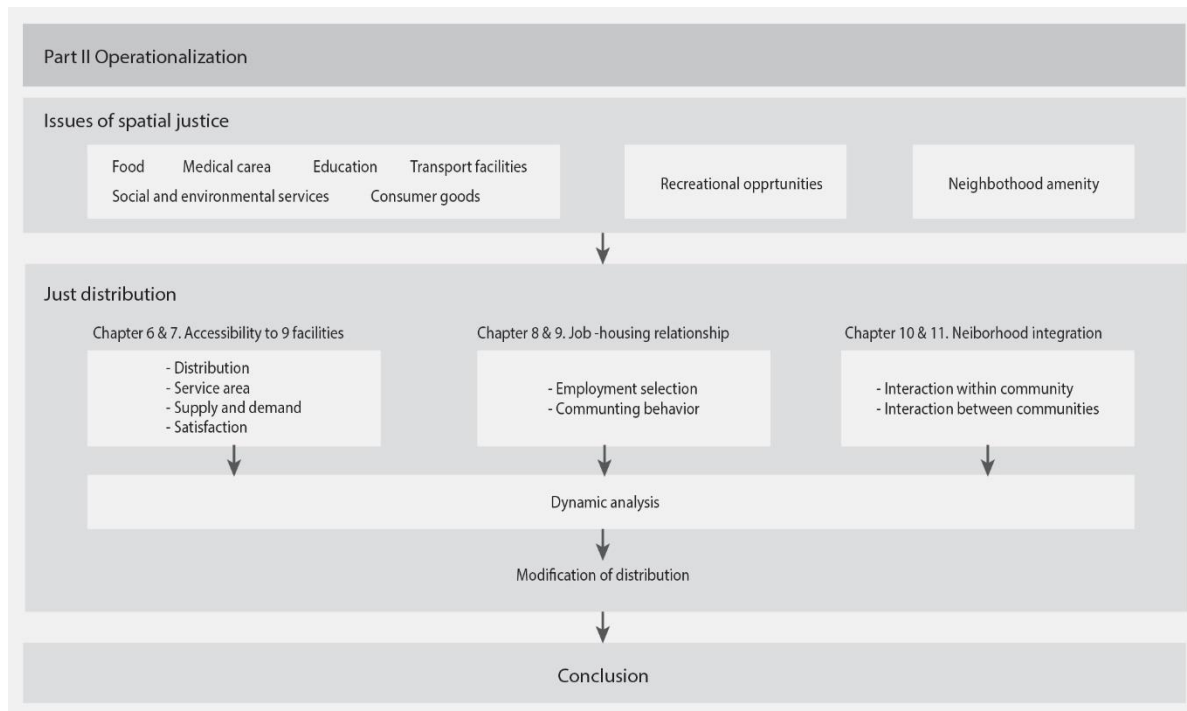
### **5.3.3 Spatial analyses**

Another important method used in this study is spatial analysis, which refers to a numerical calculation run and expressed on a space platform. Spatial analysis in this study is achieved using the ArcGIS system; methods used include spatial characterization, spatial statistical analysis, spatial interpolation and overlay analysis. Firstly, the use of spatial characterization aims to build up a base dataset. The research area, the administrative area of district and sub district, the urban route system, locations of housing and workplaces and the service point of facilities are visualized in different layers (point, polyline and polygon). The base map is edited on the basis of an online Google map and several paper maps showing administrative boundaries, and the locations of services, roads and sites of workplaces were manually added onto the base map. Simultaneously, the attributes of each spatial element obtained from the survey and statistics, like scale, population, occupation etc., were entered into the attribute table for supporting further calculations. Secondly, this study performed certain spatial calculations, examining distance, movements and service area. In Chapter 6, the scale of facilities is depicted by mean of spatial statistical analysis. And further work on service areas is based on spatial interpolation (inverse decay weight) and overlay analysis (includes the polyline layers of urban route system, point layers of service location and housing location) to calculate accessible places at a certain time. In Chapter 7, the job and housing relationship demands the expression of concentration and movement, thus we have implemented spatial statistical tools – “directional concentration” and the “Spider” drawing tool – to connect corresponding cases.

## **Part III**

### **Operationalization**





**Fig. 6.1 Outline of part III operationalization**

Source: Own draft, 2017.

Based on the theoretical discussion in Chapter 2, the operationalization regarding spatial justice with reference to social housing communities in Guangzhou will open by examining three issues: accessibility to facilities, the job–housing relationship and neighbourhood integration. The supporting data to be examined comes mainly from the questionnaires (see Appendices A.2) and the interviewees (see Appendices A.3). As shown in part 5.2.4 on the results of fieldwork, we surveyed in total 660 residents of 13 selected social housing communities using questionnaires, and 60 residents of the neighbouring communities of Jinshazhou, Jude and Fanghe (see Tab.5.7). Approaches used to measure justice include spatial analysis (in mapping software ArcGIS), quantitative analysis (SPSS and Excel) and a qualitative method. The next six chapters (Chap.6 -Chap.11) will focus on answering these questions:

**Accessibility to facilities.** Can residents in social housing communities access public facilities easily (e.g. education, health services, commercial services and transportation)?

What is the distance between the location of the social housing and the public facilities? And how much time does it take to reach these services?

- In comparison with other citizens, do the inhabitants of social housing enjoy equal access?
- Do services at facilities meet the demands of residents or not?
- Does any difference exist between residents of the 13 communities in terms of accessing public facilities? If yes, what is the reason for the differences?

**Job–housing relationship.** Do people experience aggravated job–housing mismatch problems after moving into social housing?

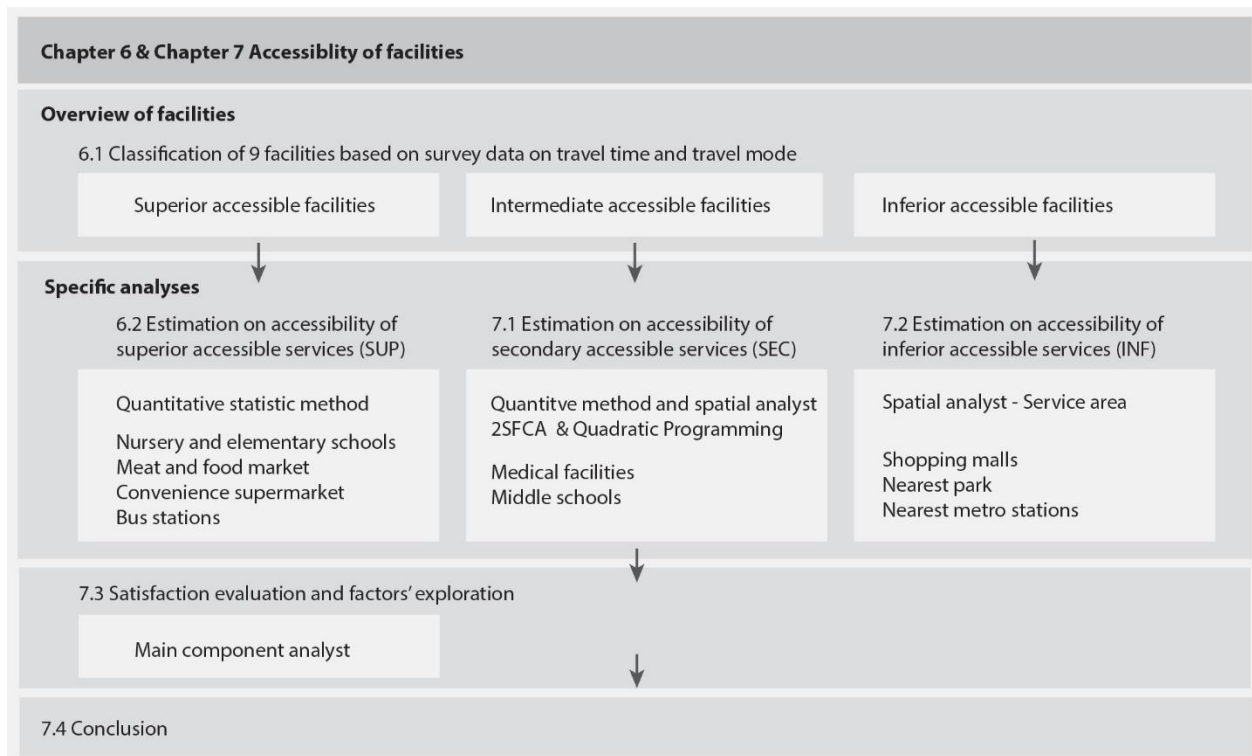
- Does resettlement in social housing have any effects on the employment rate of residents?
- Can residents access their workplaces easily?
- How do residents assess connections between job and housing?
- What factors may affect residents when changing workplaces?

**Neighbourhood integration.** Do the residents experience social segregation or discrimination after resettling in social housing communities?

- How often does an individual interact with neighbours within the same community and those in nearby residential areas?
- How often do residents participate in political and sociocultural activities?
- Are residents psychologically satisfied with the current social connections?
- What factors may affect the integration of residents in social housing communities?

## 6 Classification of facilities and accessibility of basic social facilities

### Spatial justice at city level – commuting-based analysis



**Fig. 6.2 Outline of Chapters 6 and 7: accessibility of facilities**

Source: own draft, 2017.

### 6.1 Introduction to the nine selected facilities

A survey of geographical accessibility has two facets: required travel time and selected travel mode. Many studies on spatial accessibility have made use of travel time as the criterion to indicate accessibility. That is to say, a service that can be reached within a shorter time has higher accessibility than one that takes longer to reach. However, even if the same time is spent on getting to a facility, travelling by bus and by foot reveal differences in terms of accessibility and convenience. For residents in social housing community in particular, limited economic conditions may induce them firstly to choose walking rather than taking a bus. Moreover, a certain number of social housing communities are situated in newly developed areas where public transport has not been well established, thus residents may not choose an ideal travel mode as expected. Limitations in economic ability and available traffic options may lead to residents' travel time being longer than ordinary citizens, on one's own initiative or passively. If the study only focuses on travel time to explain accessibility, the results would be partial and unconvincing. Therefore, our study considering both travel mode and travel time.

Then, in order to test facilities with different functions, the study involved daily essential services with reference to the criteria for social well-being proposed by Smith (1973: 70). These indicators cover seven aspects: 1) income, wealth and employment, 2) the living environment, 3) health, 4) education, 5) social order or disorganization, 6) social belonging, alienation and participation, and 7) recreation and leisure. This study not only studies health facilities and public transport facilities, but also involves other seven facilities that are closely linked to residents' daily lives. The study selects nine essential facilities: nursery and elementary schools, meat and food markets, convenience supermarkets, nearest bus station, medical facilities, middle schools, shopping malls, the nearest park and the nearest metro station. Our study has summarized the facilities of the 13 surveyed communities along with official documents and plane maps provided by local government (see Tab.6.1). Among these services, the first four (i.e. nursery and elementary schools,

meat and food markets, convenience commercial facilities, and the nearest bus station) are commonly provided as attached facilities from the very beginning. Most of them are located within the community area or just adjacent to the residential area. Middle schools are an attached facility in several large-scale communities (see in Tab.6.1). Large-size communities have own middle school service, and small-size communities (e.g. Fanghe, Guocun, Dang'en, Jide, Huize Yaxuan and Likang) are designed with no middle school but share neighbouring facilities. Provision of medical facilities for social housing communities reveals a complicated situation. Local government defines the level of local medical supply as satisfying the basic demands of residents. Normally, only physicians, and clinics such primary health services are situated nearby. Comprehensive hospitals with better medical technology are situated far away. The rest of the facilities like shopping malls, parks and metro stations are not physically integrated, as shopping malls, parks and metro stations are not considered to be essential services in social housing communities. They are urban public resources, the distribution of which is influenced by city planning, marketing and the ecological environment. Fanghe, Guocun and Jinshazhou are better served with transportation because of their spatial proximity to metro stations.

**Tab. 6.1 Supporting facilities of the 13 surveyed social housing communities**

Community		Services	Nursery and elementary schools	Meat and food markets	Convenience supermarkets	Nearest bus station	Medical facilities	Middle schools	Shopping malls	Nearest park	Nearest metro station
Western Cluster – Liwan District	Fanghe		√	√	√	√	√	-	-	-	√
	Guocun		√	√	√	√	√	-	-	-	√
	Dang'en		√	√	√	√	√	-	-	-	-
Middle Cluster – Haizhu District	Jude		√	√	√	√	√	√	-	-	-
Eastern Cluster – Tianhe District	Tangde		√	√	√	√	√	√	-	-	-
	Guangdan		√	√	√	√	√	-	-	-	-
	Tai'an		√	√	√	√	√	√	-	-	-
	Anxia		√	-	√	√	√	-	-	-	-
Northern Cluster – Baiyun District	Zede		√	√	√	√	√	√	-	-	-
	Jinshazhou		√	√	√	√	√	√	-	-	√
	Jide		√	√	√	√	√	-	-	-	-
	Huize Yaxuan		√	√	√	√	√	-	-	-	-
	Likang		√	-	√	√	√	-	-	-	-

Source: Guangzhou Bureau of Land Resource and Housing, January 2013. Draft: R. CHAO. 2017.

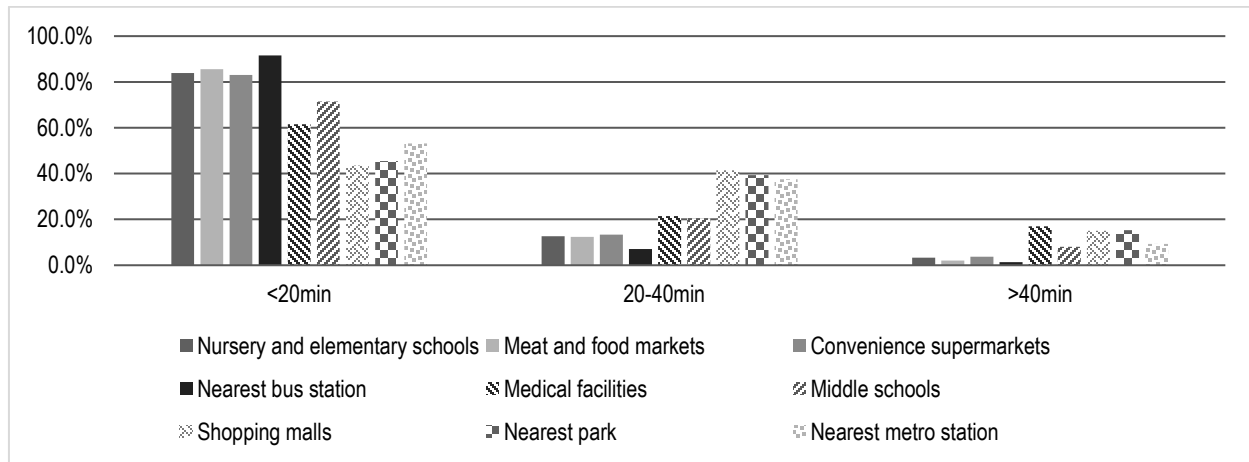
**Classification of facilities according to the ease of access.** In Fig.6.3 and Fig.6.4, we respectively summarized the travel mode and travel time to access nine essential facilities from the answers of 660 respondents. The ease of access to the facilities would be that people can get to their destination in short time by using slow-moving vehicles. Travel time was classified into three categories: < 20min, 20–40min and > 40min. Travel mode includes walking, bicycle, moped, bus, metro and car. Among them, the travel speed of walking, bicycle, moped and bus is slower than that of metro and car. And going by foot and by bicycle are two least expensive ways. Therefore, when most people can reach a facility within 20 minutes (min) on foot this implies that it is very accessible. If a high percentage of people have to reach a facility using the metro or a car and take over 40 min, this may indicate a situation of less accessibility. Based on the 660 interviewees' responses to the ease with which facilities may be accessed, this study divided the nine facilities into three groups: most accessible facility (MOS), less accessible facility (LES) and least accessible facility (LEA):

- Most accessible facility (MOS): nursery and elementary schools, meat and food markets, convenience supermarkets and bus station
- Less accessible facility (LES): medical facilities and middle schools
- Least accessible facility (LEA): shopping mall, nearest park and nearest metro station

As to the MOS facilities, over 80% of surveyed residents was able to access them within 20 min, and nearly all respondents can reach within 40 min (see Fig.6.3). At the same time, more than 90% of surveyed residents chose to visit these facilities on foot, whereas a very small number of respondents access them by bicycle or by bus (see Fig.6.4).

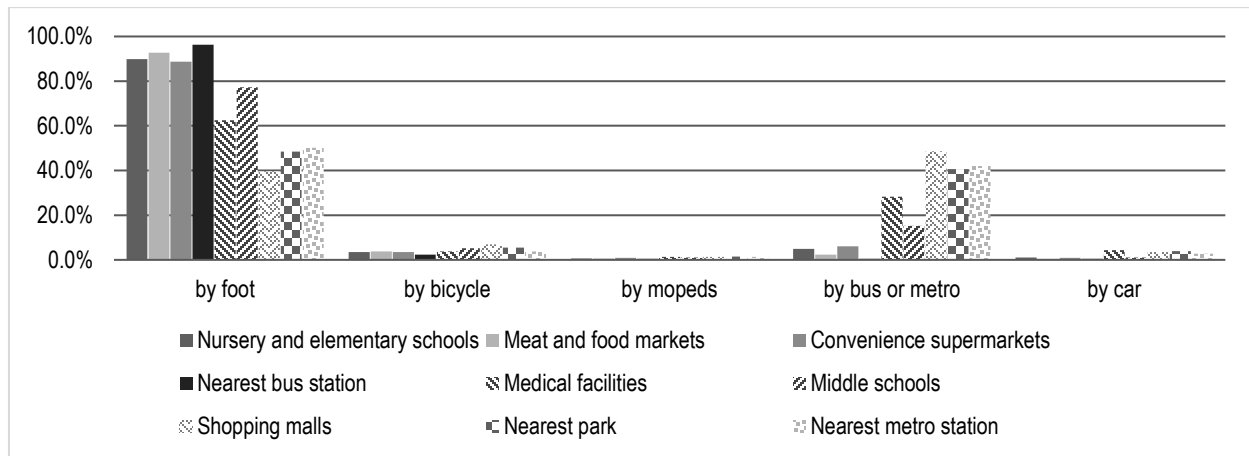
In contrast, only 40–50% of surveyed residents take less than 20 min to reach shopping malls, parks and metro station, whereas another 40% of those take 20 to 40 min (see Fig. 6.3). Additionally, 40–50% of respondents chose walking as the travel mode and another 40% travel by bus (see Fig.6.4). It is notable that visiting these three facilities required faster vehicles and longer time by respondents, while accessing the other two facilities, middle school and medical facility, required an intermediate level of travel time. The percentages of respondents reaching these within 20 min were 61.6% and 71.5% respectively, while those requiring 20–40 min comprise 21.4% and 20.5% respondents respectively. Nevertheless, apart from walking and public transport, bicycle, mopeds and cars were viable but less common travel modes. In particular, less than 2% of respondents used the latter two modes (Fig. 6.4). When choosing a travel mode, the surveyed residents showed a preference for walking or public transport.

Overall, by analysing the required travel time and selected travel mode of respondents collectively, the nine facilities could be regrouped into categories: MOS, LES and LEA. This classification is also consistent with the fact of attached facilities. MOS is physically integrated in communities, and LEA is not specially provided for communities. For LES, small-size communities share facilities with neighbouring areas and large-size communities possess their own facilities. Though the location of LES may not be spatially distant, the surveyed residents tended to select middle schools and healthcare services according to their expected needs, rather than travel distances. In the following section, our study will analyse the accessibility of three categories of facilities respectively.



**Fig. 6.3 Percentage of surveyed social housing inhabitants (n = 660) and their travel time to the nine facilities**

Source: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B1–B9 (see in Appendices A.2). Surveyed by Chao R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.



**Fig. 6.4 Percentage of surveyed social housing inhabitants (n = 660) and their travel mode to nine facilities**

Source: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B1–B9 (see in Appendices A.2). Surveyed by Chao R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

## 6.2 Accessibility of most accessible facilities (MOS)

The accessibility of defined MOS (most accessible facility) in this study, which are the very basic social services, was tested on the basis of the access time and selected travel mode of 660 respondents. By displaying the percentages of the 660 surveyed residents in the categories of travel time (< 20 min, 20–40 min and > 40 min) and travel mode (by foot, by bicycle, by public transport etc.), the ease with which these facilities are reached can be revealed. At the same time, analysis based on classified data in terms of location, time of construction, scale and dwelling mode was also adopted. Different attributes of the community may have varying effects on the accessibility of facilities. For example, medical facilities and metro transportation tend to be more concentrated in the city centre than in peripheral areas. Consequently, residents of social housing communities near city centre would find it easier to reach these services than people in outlying communities. Thus, an analysis based on classified data aims to find out whether the people surveyed experience advantages or may suffer disadvantages in accessing MOS caused by the essential features of communities (e.g. location, scale, dwelling mode etc.).

### 6.2.1 Accessibility of nursery and elementary school

According to the responses of the 660 surveyed residents, the nursery and elementary schools could be defined as a kind of very accessible facility in social housing communities. The figure shows that 83.9% of respondents could reach these facilities within 20 min and 89.9% of them chose to walk (see Fig.6.3 and Fig.6.4). However, 12.7% of respondents took 20–40 min, and 3.4% took over 40 min to reach their destinations. To identify the factors that may link to respondents' access to nursery and elementary schools, this study has summarized the travel data into the percentages of respondents by location of community, built-time, scale and dwelling mode (see Tab.6.2).

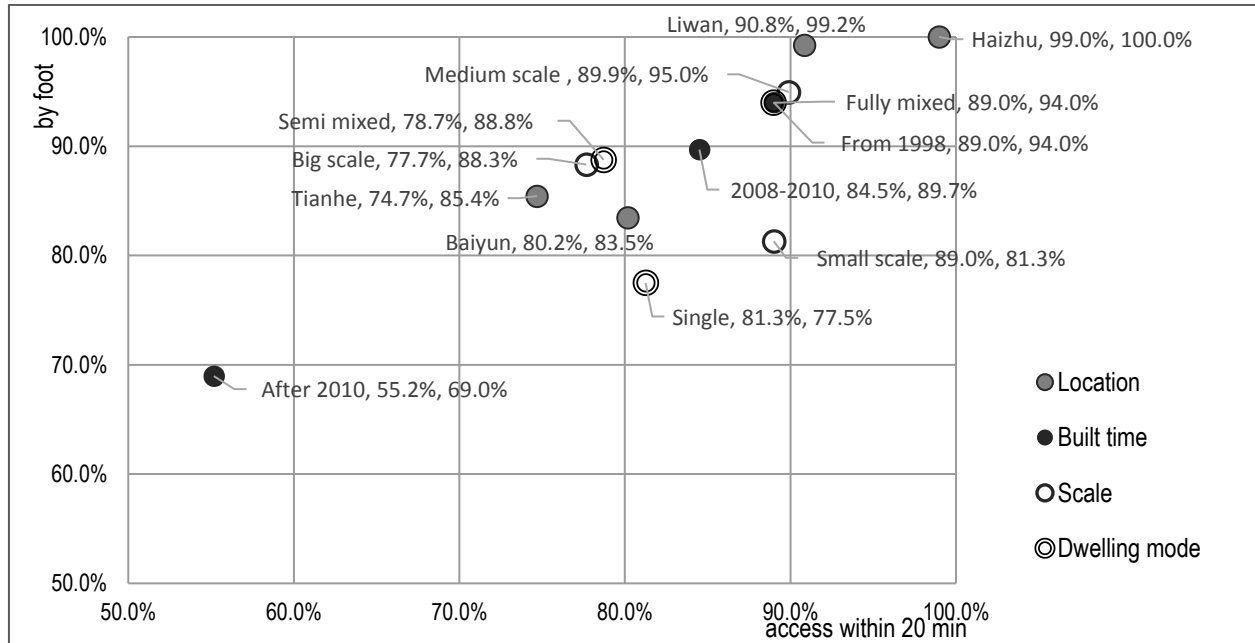
To highlight the differences between respondents in classified communities, we extract the first category (< 20 min) of travel time, and the category (by foot) of travel mode as the horizontal axis and the vertical axis. By using a scatter chart (see Fig.6.5) to explore whether respondents in which communities have advantages or disadvantages in accessing the facilities. This chart reveals high percentages in the categories of “< 20 min” (travel time) and “by foot” (travel mode), and very small percentages in the other categories (see Tab.6.2). Therefore, doing a comparative study with the two extracted categories provides a clear way of seeing the differences between the various communities.

From the disparities indicated by the 660 surveyed people in different communities, we perceived that the location and the time of construction of the social housing community have some links to access facilities for residents. Firstly, respondents from communities in different locations demonstrate certain gaps in their access to nursery and elementary schools. Surveyed residents in communities in the Liwan and Haizhu districts generally required less time (percentage of people who reached destination in 20 min: 90.8% in Liwan, 99.0% in Haizhu) than those in Tianhe and Baiyun district (respectively 74.7%, 80.2%). Additionally, the higher ratio of surveyed residents in Liwan and Haizhu went on foot (respectively 99.2%, 100.0%), and this rate declined to 85.4% and 83.5% in Tianhe and Baiyun. The survey result indicates that the location of the community has link to respondents' travel time and travel mode. This implies that residents of communities near the city centre have certain advantages in accessing nursery and elementary schools.

Secondly, a significant disparity is demonstrated between the category of communities built before and those after the year 2010. Respondents in older communities built in 1998 and in 2008–2010 showed much higher rates of walking as a travel mode: 94.0% and 89.7%, while 89% and 84.5% could reach the facilities within 20 min. Particularly, much lower rate of respondents in newly built communities developed after 2010 replied that they go on foot (55.2%) and could reach the facilities within 20 min (69.0%). This significant disparity indicates that these respondents have a much longer travel time and have options for faster vehicles. The survey results may indicate that residents in communities built after 2010 have disadvantages in accessing nursery and elementary schools.

However, no significant disparities were found between respondents of communities of different scales and dwelling mode. Surveyed residents in medium-scale communities (population: 1500–3000) appeared to have slightly greater ease in reaching facilities than those in large-scale (population > 4000) and small-scale communities (population < 1500). Compared to large and small communities, respondents in medium-size communities had a slight advantage in terms of less travel time (89.9% people reach facilities within 20 min) and easier travel mode (95.0% people reach

facilities by foot) respectively. Similarly, respondents in communities of single dwelling mode perceived few disadvantages.



**Fig.6.5 The percentages of surveyed residents accessing nursery and elementary schools within 20 min, by foot**

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n=660), Question B2 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

**Tab. 6.2 Percentages of surveyed residents by travel time and by travel mode regarding access to nursery and elementary schools, by location, time of construction, scale and dwelling mode**

Accessibility Categories		Travel time			Travel mode				
		<20min	20-40 min	>40 min	by foot	by bicycle	by mopeds	by bus or metro	by car
Location	Liwan	90.8%	8.4%	0.8%	99.2%	0.0%	0.0%	0.8%	0.0%
	Haizhu	99.0%	1.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
	Tianhe	74.7%	20.9%	4.4%	85.4%	3.8%	0.0%	8.2%	2.5%
	Baiyun	80.2%	14.5%	5.4%	83.5%	6.6%	1.7%	7.0%	1.2%
Time of construction	From 1998	89.0%	8.7%	2.3%	94.0%	0.7%	0.0%	4.3%	1.0%
	2008-2010	84.5%	11.4%	4.1%	89.7%	5.2%	1.5%	3.0%	0.7%
	After 2010	55.2%	39.7%	5.2%	69.0%	10.3%	0.0%	17.2%	3.4%
Scale <sup>a</sup>	Big scale	77.7%	17.7%	4.7%	88.3%	3.0%	0.7%	6.3%	1.7%
	Medium scale	89.9%	8.0%	2.1%	95.0%	1.7%	0.0%	2.5%	0.8%
	Small scale	89.0%	8.8%	2.2%	81.3%	9.9%	2.2%	6.6%	0.0%
Dwelling mode <sup>b</sup>	Fully mixed	89.0%	8.7%	2.3%	94.0%	0.7%	0.0%	4.3%	1.0%
	Semi mixed	78.7%	16.9%	4.4%	88.8%	4.0%	0.8%	4.8%	1.6%
	Single	81.3%	15.0%	3.8%	77.5%	12.5%	2.5%	7.5%	0.0%

Note: <sup>a</sup> Categories of scale are natural break which is based on the population of social housing communities, large scale refers to communities with over 4000 residents; medium scale refers to a range of 1500–4000; and small scale refers to < 1500 population. <sup>b</sup> Fully mixed refers to three different types of household (early social housing: ANJU housing, low-rent housing and affordable housing) mixed in communities. Half mixed refers to two kinds of social housings (low-rent housing and affordable housing) which are spatially integrated in the same community but located in different buildings and normally separated by paths. Single community means a small social housing community built after 2008, which comprises only affordable housing.

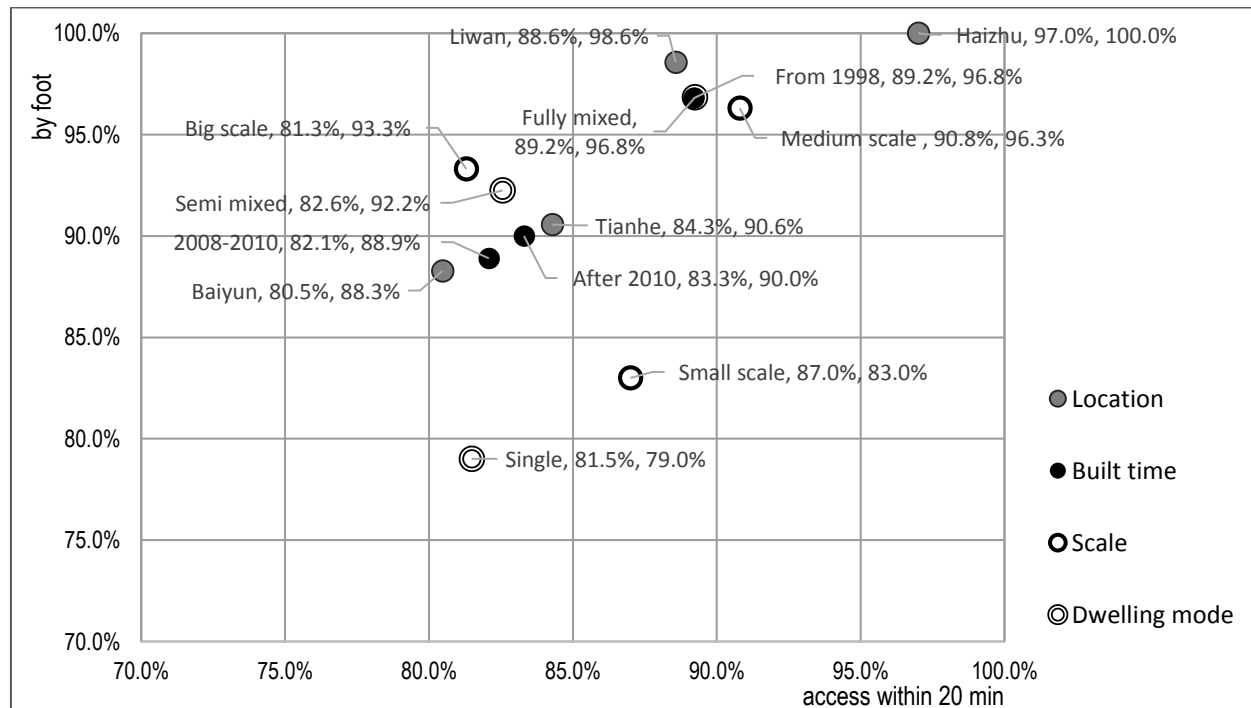
Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B2 (see in Appendices 2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

To conclude, these survey findings show that residents in social housing communities can generally reach nursery and elementary school facilities easily. Surveyed residents, particularly those in centrally located communities (in the districts of Liwan and Haizhu), indicated advantages in reaching nursery and elementary schools. And respondents in newly built communities after 2010 indicated a situation where fewer of them can reach the facilities within 20 min and go on foot. The survey results demonstrated that residents in new communities might be disadvantaged in terms of access to nursery and elementary schools, whereas residents of central communities might have advantages when accessing facilities. The disadvantages of respondents in newly built communities indicate that the length of time that the community has been built or the length of residence has a positive relationship to accessibility. In addition, the weak advantages stated by respondents in medium-scale communities and communities with semi- or fully mixed dwelling modes, suggest that developing social housing communities of a reasonable size and with a mixed dwelling mode would be advantageous for residents in accessing nursery and elementary schools.

### 6.2.2 Accessibility to meat and food markets

Travel data obtained from the 660 surveyed residents indicate that meat and food markets belong to the very accessible facilities category in social housing communities. The accessibility of meat and food markets will be explained by using the surveyed data on travel time and travel mode from the 660 interviewees. The figures show that 85.6% of respondents could reach these facilities within 20 min and 92.8% of them chose to walk (see Fig.6.3 and Fig.6.4). This section focuses on detailed accessibility by residents in different social housing communities, to identify the factors of community may be linked to disparities in access to meat and food markets.

In addition to summarizing the travel data by the percentages of respondents in terms of location of community, built-time, scale and dwelling mode (see Tab.6.3), our study also took two categories (“< 20 min” of travel time and “by foot” of travel mode) as axis of horizontal and vertical axes respectively (see Fig.6.6). Most respondents thought that they could reach this facility within 20 min and most of the rest of respondents stated they can reach it within 20–40 min. The majority of respondents chose walking as the travel mode, while a small percentage chose to go by bicycle. Very few of the people surveyed accessed the facility with other vehicles. Hence, using simplified data (Fig.6.6) which does not lose too much information, this becomes clear and makes sense of the significant results.



**Fig.6.6 The percentages of surveyed residents accessing meat and food markets within 20 min, by foot**

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B4 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.



From the disparities indicated by the 660 respondents in different communities, we perceived that the location of the community has strong links with the time and vehicle respondents require to reach meat and food markets. There were clear disparities in the travel time and travel mode between respondents in Haizhu Liwan district and those in Tianhe Baiyun district. Respectively, 97.0% and 88.6% respondents in social housing communities in Haizhu and Liwan stated that they could access markets in 20 min, whereas the ratio of surveyed residents in Tianhe (84.3%) and Baiyun (80.5%) who indicated they could do so was a bit lower. Moreover, nearly all respondents in communities of Haizhu and Liwan visited the facilities by walking (respectively 100.0%, 98.6%), but this ratio declines to 90.6% and 88.3% among those surveyed in communities in Tianhe and Baiyun. The higher percentages of respondents in Haizhu and Liwan for accessing the facilities in 20 min and on foot, indicated their advantages in terms of access. Therefore, residents in social housing communities which are located in the city centre may enjoy more convenience in reaching meat and food markets than those in peripherally located communities in Baiyun and Tianhe.

Then, fewer interviewees in small-scale communities (83.0%) went to meat and food market on foot. This may be compared with the surveyed percentages in medium-scale and large-scale communities, where 96.3% and 93.3% of respondents respectively chose walking as the travel mode. Similarly, 79.0% of surveyed residents in communities with a single dwelling mode chose on foot, 12.3% opted bicycle and 6.2% chose bus or metro (see Tab.6.3). In addition, in the other communities (semi-mixed and fully mixed), the ratio of respondents who walked to the markets reached 92.2% and 96.8% respectively. Hence, these survey figures indicate that residents of small-scale social housing communities with a single dwelling mode may not have such ease of access to meat and food markets as other communities.

**Tab. 6.3 Percentages of surveyed residents by travel time and travel mode in terms of access to meat and food markets, by location, time of construction, scale and dwelling mode**

Categories		Accessibility	Travel time			Travel mode				
			<20min	20-40 min	>40 min	by foot	by bicycle	by mopeds	by bus or metro	by car
Location	Liwan	88.6%	10.7%	0.7%	98.6%	0.0%	0.0%	1.4%	0.0%	
	Haizhu	97.0%	3.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	
	Tianhe	84.3%	14.5%	1.3%	90.6%	7.5%	0.0%	1.3%	0.6%	
	Baiyun	80.5%	15.6%	3.9%	88.3%	5.1%	1.6%	4.3%	0.8%	
Time of construction	From 1998	89.2%	10.4%	0.3%	96.8%	1.3%	0.3%	1.6%	0.0%	
	2008-2010	82.1%	14.0%	3.9%	88.9%	5.7%	1.1%	3.6%	0.7%	
	After 2010	83.3%	15.0%	1.7%	90.0%	8.3%	0.0%	0.0%	1.7%	
Scale <sup>a</sup>	Big scale	81.3%	16.2%	2.5%	93.3%	2.5%	1.0%	2.5%	0.6%	
	Medium scale	90.8%	8.8%	0.4%	96.3%	2.9%	0.0%	0.8%	0.0%	
	Small scale	87.0%	9.0%	4.0%	83.0%	10.0%	1.0%	5.0%	1.0%	
Dwelling mode <sup>b</sup>	Fully mixed	89.2%	10.4%	0.3%	96.8%	1.3%	0.3%	1.6%	0.0%	
	Semi mixed	82.6%	14.3%	3.1%	92.2%	4.3%	0.8%	1.9%	0.8%	
	Single	81.5%	13.6%	4.9%	79.0%	12.3%	1.2%	6.2%	1.2%	

Note: <sup>a</sup> Categories of scale are natural break which is based on the population of social housing communities, large scale refers to communities with over 4000 residents; medium scale refers to a range of 1500–4000; and small scale refers to < 1500 population. <sup>b</sup> Fully mixed refers to three different types of household (early social housing: ANJU housing, low-rent housing and affordable housing) mixed in communities. Half mixed refers to two kinds of social housings (low-rent housing and affordable housing) which are spatially integrated in the same community but located in different buildings and normally separated by paths. Single community means a small social housing community built after 2008, which comprises only affordable housing.

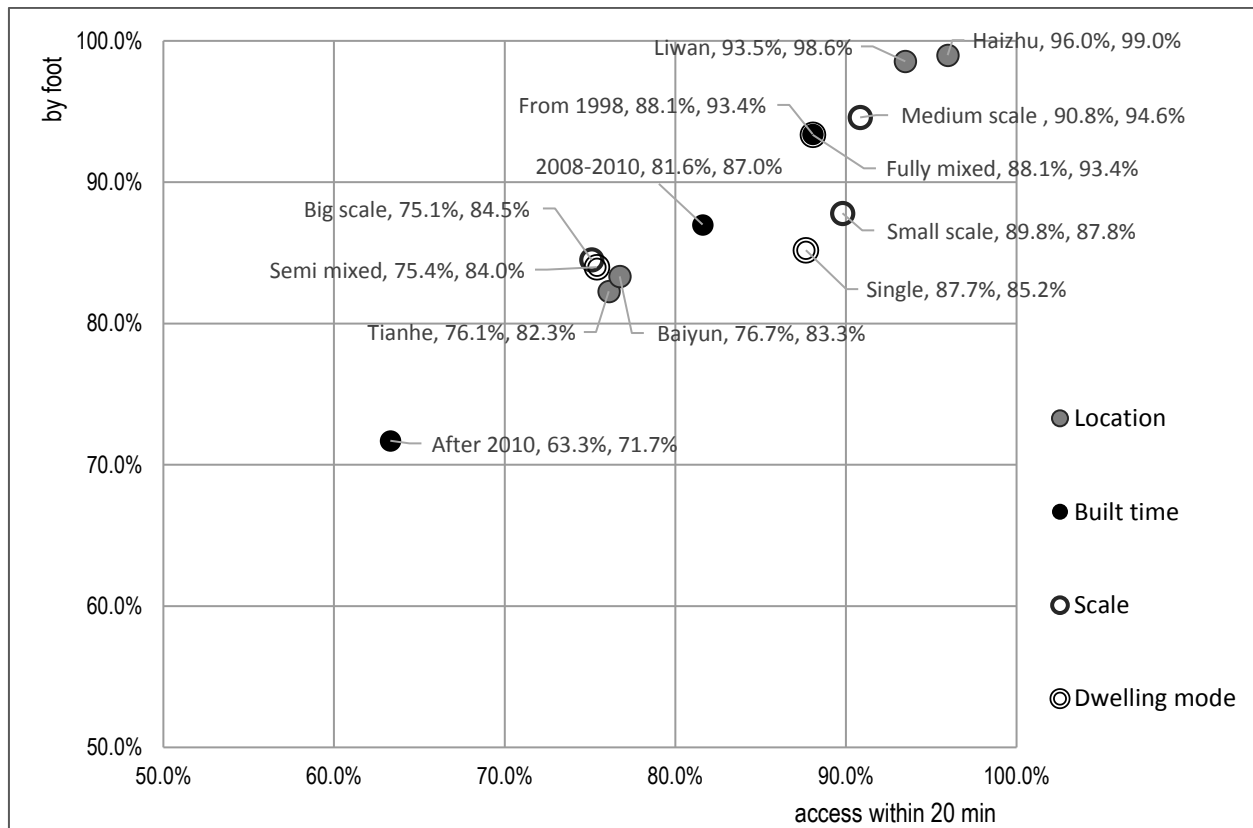
Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B4 (see in Appendices A.2). Surveyed by Chao, R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

To summarize, differences in percentages of respondents in terms of travel time and travel mode between those in communities in or near the central area (Haizhu and Liwan) indicate that the latter find it easier to access meat and food markets in a short time, while respondents in communities with a single dwelling type and on a small scale show some disadvantages. Therefore, we may perceive from these survey figures that residents living in communities in a

central location may have better accessible to meat and food markets. In contrast, residents living in small, single-dwelling communities may experience some inconvenience.

### 6.2.3 Accessibility of convenience supermarket

From the travel data from 660 respondents, the convenience supermarket would appear to be a very accessible facility for social housing communities. The figures in Fig.6.3 and Fig.6.4 indicate that 83.1% of surveyed people were able to reach convenience supermarkets within 20 min, and 88.7% of them chose to walk. In same way of classified summarizing the percentages of respondents by travel time (<20 min, 20-40 min, and >40 min) and travel mode (by foot, by bicycle, by mopeds etc.) into Tab.6.4. Furtherly, the study mainly focuses on percentages of the category of travel time “<20 min” and the category of travel mode “by foot”, to explore the disparities among residents of different communities in accessing supermarket (see Fig.6.7).



**Fig.6.7 The percentages of surveyed residents accessing convenient supermarket within 20 min, by foot**

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B5 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

Firstly, the disparities perceived among the percentages of communities in the four districts in respondents' access to supermarkets may strongly link to the location of communities. A clear gap in accessibility is indicated between respondents near the centre area (Liwan Haizhu district) and those on the fringe (Tianhe Baiyun district) (see Fig.6.7). The ratio of surveyed people accessing supermarkets in 20 min was 96.0% and 93.5% in communities in Haizhu and Liwan respectively. This rate dropped to 76.7% of respondents in Tianhe and 76.7% in Baiyun, who were able to reach the facility within 20 min. Furthermore, 99.0% respondents in Haizhu and 98.6% in Liwan walked to convenience supermarkets, while 82.3% of respondents in Tianhe and 83.3% in Baiyun went on foot. Noticeable disparities indicated by the survey may imply that residents in communities that are close to the city centre have significant ease of access to supermarkets.

Secondly, surveyed residents of newly built communities (built after 2010) indicated a notably lower rate for accessing supermarket within a short time (20min) and with easy travel mode (by foot). As seen from Fig.6.7, 88.0% of

respondents in communities built from 1998 and 81.6% of communities built in 2008–2010, stated that access to the supermarkets took less than 20 min. The rate fell to 63.3% in communities built after 2010. At the same time, while 93.4% and 87.0% of respondents in older communities chose walking, only 71.7% in new communities went on foot. The survey facts imply that residents of newly built communities (after 2010) would experience disadvantages in reaching a supermarket.

Thirdly, respondents in middle-size communities may have certain advantages in terms of both short travel time (90.8% access within 20 min) and easy travel mode (94.6% go on foot) over those on a large scale (75.1% access within 20min, 84.5% go on foot) or a small scale (89.8% access within 20min, 87.8% go on foot).

To sum up, higher ratios for short times (access in 20 min) and easy travel mode (go on foot) were stated by respondents in communities near the city centre (in the districts of Haizhu and Liwan), and by those in communities built before 2010 (built from 1998 and built in 2008–2010), which implies that residents in these communities may have advantages in accessing convenient supermarkets. Nevertheless, residents in medium-scale communities may have more advantages in accessing supermarket than residents in big or small communities. One may learn from this conclusion, that having better access to convenient supermarkets would be good choice when developing social housing communities of medium scale.

**Tab. 6.4 Percentages of surveyed residents by travel time and by travel mode in terms of access to convenience supermarket, by location, time of construction, scale and dwelling mode**

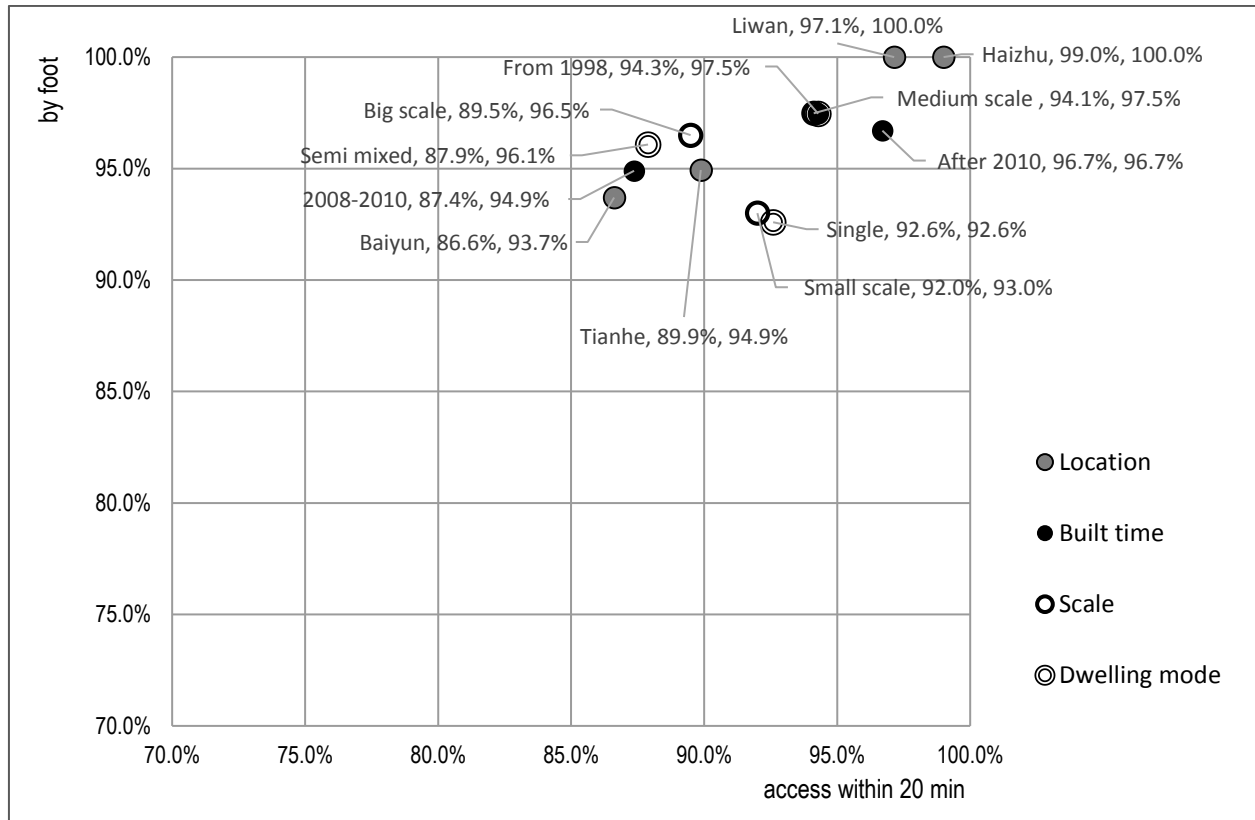
Categories		Accessibility	Travel time			Travel mode				
			<20min	20-40 min	>40 min	by foot	by bicycle	by mopeds	by bus or metro	by car
Location	Liwan	93.5%	5.1%	1.4%	98.6%	0.0%	0.0%	1.4%	0.0%	
	Haizhu	96.0%	4.0%	0.0%	99.0%	0.0%	0.0%	1.0%	0.0%	
	Tianhe	76.1%	20.1%	3.8%	82.3%	7.0%	0.0%	9.5%	1.3%	
	Baiyun	76.7%	17.1%	6.2%	83.3%	4.7%	2.3%	8.1%	1.6%	
Time of construction	From 1998	88.0%	10.4%	1.6%	93.4%	1.6%	0.3%	4.7%	0.0%	
	2008-2010	81.6%	13.0%	5.4%	87.0%	4.7%	1.8%	5.1%	1.4%	
	After 2010	63.3%	30.0%	6.7%	71.7%	8.3%	0.0%	16.7%	3.3%	
Scale <sup>a</sup>	Big scale	75.1%	18.9%	6.0%	84.5%	3.2%	1.6%	9.1%	1.6%	
	Medium scale	90.8%	8.4%	0.8%	94.5%	3.4%	0.0%	2.1%	0.0%	
	Small scale	89.8%	7.1%	3.1%	87.8%	5.1%	1.0%	5.1%	1.0%	
Dwelling mode <sup>b</sup>	Fully mixed	88.0%	10.4%	1.6%	93.4%	1.6%	0.3%	4.7%	0.0%	
	Semi mixed	75.4%	17.6%	7.0%	84.0%	4.3%	1.6%	8.2%	2.0%	
	Single	87.7%	11.1%	1.2%	85.2%	8.6%	1.2%	3.7%	1.2%	

Note: <sup>a</sup> Categories of scale are natural break which is based on the population of social housing communities, large scale refers to communities with over 4000 residents; medium scale refers to a range of 1500–4000; and small scale refers to < 1500 population. <sup>b</sup> Fully mixed refers to three different types of household (early social housing: ANJU housing, low-rent housing and affordable housing) mixed in communities. Half mixed refers to two kinds of social housings (low-rent housing and affordable housing) which are spatially integrated in the same community but located in different buildings and normally separated by paths. Single community means a small social housing community built after 2008, which comprises only affordable housing.

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B5 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

### 6.2.4 Accessibility to bus station

Surveyed residents in social housing communities responded that the bus stations were extremely easy to access. As shown in Fig.6.3 and Fig.6.4, 91.6% of interviewees were able to reach one in 20 min, and 96.3% of them walked to the bus station. In this section, we try to explain accessibility on the basis of the surveyed data obtained from the 660 respondents about travel time and travel mode to bus station. We then identify the type of community in which residents may have better accessibility or otherwise.



**Fig.6.8 The percentages of surveyed residents accessing the nearest bus station within 20 min, by foot**

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B8 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

The percentages of respondents is summarized in Tab.6.5 by communities with different attributes, such as location, time of construction, scale and dwelling mode. Furthermore, the data of categories (“< 20 min” of travel time and “by foot” of travel mode) have been extracted from Tab.6.5, for drawing a scatter plot (see Fig.6.8). Owing to the percentages of respondents being particularly concentrated on these two answers, most surveyed residents fell into the categories of “20–40 min” and “by bicycle”, and very few took over 40 min or chose other vehicles to access the bus station. Therefore, the differences shown with two selected categories may clearly indicate any disparities of accessibility of bus station.

No significant disparities were indicated by respondents; only those in communities in or near the city centre showed some advantages in accessing the bus station within a short travel time (within 20 min) and by an easier travel mode (by foot). The percentage of respondents who could get to bus station within 20 min was high at 99.0% in Haizhu district and 97.1% in Liwan. The percentage of those who was able to reach a bus station within 20 min is comparably lower among respondents from communities in Tianhe (89.9%) and Baiyun (86.6%). In addition, all surveyed residents in these two districts walked to the transport facility. Comparably, the ratio declined to 94.9% of respondents in Tianhe and 93.7% in Baiyun. The advantages stated by respondents may indicate that residents of communities near the city centre (e.g. in district Haizhu and Liwan) may have superior access to the bus station compared to those in remote located communities.

**Tab. 6.5 Percentages of surveyed residents by travel time and by travel mode in terms of access to the nearest bus station, by location, time of construction, scale and dwelling mode**

Categories		Accessibility	Travel time			Travel mode				
			<20min	20-40 min	>40 min	by foot	by bicycle	by mopeds	by bus or metro	by car
Location	Liwan		97.1%	2.1%	0.7%	100.0%	0.0%	0.0%	0.0%	0.0%
	Haizhu		99.0%	1.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
	Tianhe		89.9%	8.2%	1.9%	94.9%	3.8%	0.0%	0.6%	0.6%
	Baiyun		86.6%	11.4%	2.0%	93.7%	3.5%	1.2%	0.8%	0.8%
Time of construction	From 1998		94.3%	5.1%	0.6%	97.5%	1.9%	0.0%	0.6%	0.0%
	2008-2010		87.4%	10.5%	2.2%	94.9%	2.9%	1.1%	0.4%	0.7%
	After 2010		96.7%	1.7%	1.7%	96.7%	1.7%	0.0%	0.0%	1.7%
Scale <sup>a</sup>	Big scale		89.5%	9.2%	1.3%	96.5%	1.6%	0.6%	0.6%	0.6%
	Medium scale		94.1%	5.0%	0.8%	97.5%	2.1%	0.0%	0.4%	0.0%
	Small scale		92.0%	5.0%	3.0%	93.0%	5.0%	1.0%	0.0%	1.0%
Dwelling mode <sup>b</sup>	Fully mixed		94.3%	5.1%	0.6%	97.5%	1.9%	0.0%	0.6%	0.0%
	Semi mixed		87.9%	10.2%	2.0%	96.1%	2.0%	0.8%	0.4%	0.8%
	Single		92.6%	4.9%	2.5%	92.6%	4.9%	1.2%	0.0%	1.2%

Note: <sup>a</sup> Categories of scale are natural break which is based on the population of social housing communities, large scale refers to communities with over 4000 residents; medium scale refers to a range of 1500–4000; and small scale refers to < 1500 population. <sup>b</sup> Fully mixed refers to three different types of household (early social housing: ANJU housing, low-rent housing and affordable housing) mixed in communities. Half mixed refers to two kinds of social housings (low-rent housing and affordable housing) which are spatially integrated in the same community but located in different buildings and normally separated by paths. Single community means a small social housing community built after 2008, which comprises only affordable housing.

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B8 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

### 6.3 Satisfaction with most accessible facilities

Services like nursery and elementary schools, meat and food markets, convenient supermarkets and bus stations are such basic services needed in daily life of every citizen. To identify whether the provision of these essential facilities is just or equitable or not, an examination of whether access was easy would not be enough: it would also be important to assess residents' satisfaction with the quantity and quality of facilities. As was mentioned in Chapter 2.1.2, justice comprises multiple elements including formal equality, substantial equality, needs, desert and so on. In a real sense, a just distribution means that very basic needs (minimum standard of living) should be fulfilled and interregional multiplier effects through the allocation of resources should be maximized (Harvey, 2009:99). Therefore, the analysis in this section focuses on satisfaction with regard to the distance, quantity and quality of these four facilities. In order to evaluate whether basic demands are fulfilled in social housing communities, our analysis here makes use of the responses of 660 interviewees from 13 social housing communities. The survey interviewed 660 respondents regarding their own assessments of the distance, supply and service quality of MOS. The questions used a five-point scale, in terms of which the five responses range from very positive to very negative. Interviewees could mark the one that mostly matched their individual opinion. We summarize the percentages of each category in Tab.6.6.

The survey results indicated that respondents were very satisfied with the spatial distance between housing and facilities. However, responses regarding satisfaction with supply level, particularly with the quality of these facilities, declines to a lower level. Firstly, most respondents indicated that they were very satisfied or satisfied with the distance to these facilities. In evaluations of distance to nursery and elementary schools, 43.3% of respondents selected "very satisfied" and 31.5% chose "satisfied"; in contrast, only 3.9% and 2.4% chose "unsatisfied" and "very unsatisfied" (see Tab.6.6). The percentage of respondents indicated positive satisfaction reached 84.4%. Similarly, the total rate of categories "very satisfied" and "satisfied" regarding distance to the other three facilities was very high (meat and food market: 82.2%, convenient supermarket: 79.3%, public transportation: 82.1%), and the rate of negative answers

(unsatisfied and very unsatisfied) were 5.9%, 7.1% and 5.1% respectively. The large proportions of positive satisfaction reveal that surveyed residents psychologically perceived that the MOS were spatially close. Secondly, however, satisfaction of respondents with the supply and quality of these basic facilities did not reach the same levels as the distance. As to the supply level of faculty of nursery and elementary schools, 52.6% of respondents sensed they were normal, while 29.8% of them was satisfied and 6.5% unsatisfied. At the same time, 55.9% of respondents judged the quality to be normal, while 26.5% were satisfied and 8.8% unsatisfied. Generally speaking, respondents hold a positive assessment of supply and service quality of nursery and elementary schools. In addition, the supply of the other three facilities (meat and food markets, convenient supermarket and public transportation) was indicated by respondents as clearly positive assessment in terms of satisfaction. However, surveyed residents' satisfaction with the prices at meat and food markets remained at the middle level. The number of them who gave positive answers was very similar to those gave negative answers.

**Tab. 6.6 Percentages of 660 respondents by categories regarding satisfaction towards most accessible facilities**

Facility	Items	Evaluation (%)					Coefficient of variance
		Very satisfied	Satisfied	Normal	Unsatisfied	Very unsatisfied	
Nursery and elementary schools	Distance to nursery and elementary school "near-far"	43.3	31.5	18.8	3.9	2.4	0.99
	Faculty of nursery and elementary school "rich-scarce"	9.7	29.8	52.6	6.5	1.4	0.65
	Educational quality "good-bad"	7.4	26.5	55.9	8.8	1.4	0.62
Meat and food markets	Distance to market "near-far"	52.7	29.5	11.8	4.2	1.7	0.89
	Commodity supplying of market "rich-insufficient"	22.3	41.8	24.1	9.2	2.6	0.99
	Selling price of market "cheap-expensive"	7.6	23.9	35.2	22.9	10.5	1.19
Convenience supermarkets	Distance to supermarket "near-far"	47.0	32.3	13.6	4.2	2.9	1.01
	Commodity supplying of supermarket "rich-insufficient"	18.3	35.0	35.5	8.8	2.4	0.93
	Selling price of supermarket "cheap-expensive"	5.6	24.4	48.0	14.2	7.7	0.92
Public transport	Distance to public transport station "near-far"	53.9	28.2	12.7	3.3	1.8	0.88
	Supply of public transport station "abundant-few"	23.2	39.8	25.9	7.4	3.6	1.04
	Operation of transport station "efficient-crowded"	19.8	29.5	28.5	13.8	8.3	1.41

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question H20-H40 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

**Tab. 6.7 Values of satisfaction of respondents towards distance, supply quantity and quality of the four most accessible facilities, by location, time of construction, scale and dwelling mode**

Services		Nursery and elementary schools			Meat and food markets			Convenient supermarkets			Public transport station		
		Distance	Quantity of faculty	Quality	Distance	Quantity of goods	Price	Distance	Quantity of goods	Price	Distance	Quantity	Efficiency
Location	Liwan	1.60	0.81	0.69	1.63	0.87	-0.11	1.61	0.81	0.11	1.69	1.09	1.16
	Haizhu	1.36	0.62	0.50	1.33	0.82	0.17	1.22	0.57	0.32	1.34	0.96	0.67
	Tianhe	0.77	0.20	0.16	1.22	0.65	0.03	1.01	0.70	0.08	1.18	0.38	0.19
	Baiyun	1.04	0.28	0.16	1.24	0.72	-0.08	1.06	0.49	-0.02	1.21	0.76	0.16
Time of construction	From 1998	1.21	0.40	0.32	1.39	0.98	0.20	1.29	0.71	0.21	1.38	0.90	0.47
	2008-2010	1.16	0.53	0.37	1.21	0.54	-0.22	1.16	0.51	-0.05	1.20	0.66	0.39
	After 2010	0.15	-0.22	-0.13	0.93	0.17	-0.57	0.48	0.25	-0.23	1.25	-0.02	-0.03
Scale	Big scale	1.06	0.40	0.31	1.20	0.60	-0.28	1.00	0.46	-0.15	1.26	0.65	0.24
	Medium scale	1.20	0.43	0.35	1.39	0.86	0.31	1.31	0.71	0.35	1.28	0.75	0.45
	Small scale	0.93	0.33	0.14	1.24	0.77	-0.17	1.34	0.65	0.05	1.43	0.83	0.72
Dwelling mode	Fully mixed	1.21	0.40	0.32	1.39	0.98	0.20	1.29	0.71	0.21	1.38	0.90	0.47
	Semi mixed	1.08	0.47	0.36	1.18	0.38	-0.34	0.96	0.43	-0.15	1.17	0.49	0.26
	Single	0.68	0.16	0.02	1.10	0.75	-0.07	1.30	0.58	0.14	1.31	0.69	0.48

Note: The data is based on the satisfaction evaluation part of the survey: questions H20-H40 which focus on respondents' perceptions of distance and quality of facilities. Each of them contains five categories in order of "very positive" to "very negative". To take H23 as an example, category "very near" takes a value of "2"; "near" "1"; "median" "0"; "far" "-1" and "very far" "-2".

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question H20-H40 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

Therefore, we obtain that residents of social housing communities may be highly satisfied with the distance to MOS. Residents may perceive that the location of facilities is quite close by and they can meet their psychological demands to a great extent. However, the facilities and educational quality of nursery and elementary schools, the price at meat and food markets and the prices at convenient supermarkets would appear not to have satisfied residents of social housing communities. To find out which respondents living in which community may be pleased with the service of facilities and those who may be not, we calculated the values of satisfaction of respondents by location, the time of construction, scale and dwelling mode of community (see Tab.6.7). In the table, the study transferred original percentages of categories into values for a brief overview. Category “very satisfied” was assigned a value of “2”, “satisfied” was assigned a value of “1”, “normal” was assigned “0”, “unsatisfied” was “-1”, and “very unsatisfied” was “-2”. So a positive value means satisfied and a negative value implies unsatisfied. The closer the value to “2” may indicate that respondents have higher satisfaction and the closer the value to “-2” should mean a lower and negative satisfaction. Analysing in this way can identify the perceived disparities between respondents in different communities, and will be helpful for improving the service of facilities to meet the call for justice.

The evaluation of nursery and elementary schools indicates a clear gap in satisfaction between respondents in communities in Liwan and Haizhu and those in Tianhe and Baiyun. The people surveyed in communities situated near the city central area (districts of Liwana and Haizhu) showed higher satisfaction values on perceived distance (respectively 1.60, 1.36), than those in communities in peripheral districts like Tianhe and Baiyun (respectively 0.77, 1.04). Similarly, respondents were also more satisfied with the supply and quality of nursery and elementary schools in communities in the city central area (quantity of faculty: Liwan 0.81, Haizhu 0.62; quality: Liwan 0.69, Haizhu 0.50). Then, values of the category “after 2010” (0.15, -0.22 and -0.13) demonstrated a significant gap in values of categories “from 1998” (1.21, 0.40 and 0.32) and “2008-2010” (1.16, 0.53 and 0.37). The result reveals that the satisfaction of respondents in communities built after 2010 was much lower than those in older communities on services provided by nursery and elementary schools. To conclude, respondents in communities near the city centre, were more pleased with the services (distance, supply and quality) of nursery and elementary schools. In contrast, respondents in communities built after 2010 might have much lower satisfaction than those in older communities (built from 1998 and built in 2008–2010). Nevertheless, compared to the satisfaction stated by interviewees in communities of a mixed dwelling mode (fully mixed and semi-mixed), the level of satisfaction among surveyed people in communities with only one housing type was a bit low.

With respect to satisfaction with meat and food markets, significant disparities appeared between respondents from communities built in different periods. Surveyed residents from older communities indicated greater satisfaction than those from younger communities. Taking an evaluation of the distance to meat and food markets as an example, the value in category “from 1998” is 1.39, but this declined to 1.21 in the category “2008–2010” and to 0.93 for “after 2010”. This means residents in older communities may be more satisfied with their meat and food markets (in regard to aspects such as distance, quantity of supply and the price).

In addition, there was a certain gap in satisfaction towards convenient supermarkets between respondents from newly built communities (after 2010) and those from older communities (from 1998, and in 2008–2010). Compared to values for older communities (distance: 1.29 and 1.16, quantity of goods: 0.71 and 0.51, and price: 0.21 and -0.05), the responded values remained at a lower level in communities built after 2010 (distance: 0.48, quantity of goods: 0.25, and price: -0.23). In addition, the satisfaction of interviewees from centrally located communities was slightly higher than those from peripherally located communities regarding the services of convenient supermarkets.

Finally, the satisfaction values of respondents in communities in Liwan and Haizhu on public transportation were obviously higher than the values of those in Tianhe and Baiyun. This gap was particularly large on evaluations of quantity of supply and operative efficiency. The values in categories “Liwan” and “Haizhu” on quantity were 1.09 and 0.96 respectively, but the values dropped to 0.39 for the category “Tianhe” and 0.76 for “Baiyun”. Similarly, the values for efficiency of public transport were 1.16 and 0.67 in “Liwan” and “Haizhu”, but they were only 0.19 and 0.16 in “Tianhe” and “Baiyun”. That is to say, regarding the supply and efficiency of public transport, the satisfaction of residents in communities near the city centre may be higher than the satisfaction of residents in communities in peripheral areas.



Nevertheless, surveyed residents from communities built after 2010 clearly demonstrated low satisfaction with the supply and operative efficiency of facilities.

### **Sub conclusion**

In conclusion, in terms of findings of the survey results, we may achieve following deductions: most residents of social housing communities should be greatly satisfied with the distance to nursery and elementary schools, particularly those in communities which lie in districts near the city centre (e.g. Liwan and Haizhu). However, their satisfaction towards the quantity of faculty and teaching quality of the facilities leans to positive but weak. In particular, the residents of communities in the periphery such as Tianhe and Baiyun, do not seem to be as pleased. Nevertheless, the services of nursery and elementary schools may hardly fulfil the demands of inhabitants in new communities that developed after 2010. They hold weakly positive satisfaction in terms of the distance, but respond with a negative assessment (unsatisfied) towards the faculty and the quality of facilities.

The evaluation also shows that social housing residents find the distance to meat and food markets and convenient supermarkets satisfactory. The satisfaction level of residents of communities built after 2010 is a bit low, however. The supply of these markets basically satisfies residents in older communities, but seems not to meet the demands of residents of communities built after 2010. As to the price level of the markets, many residents may be unsatisfied, particularly those in new communities.

Residents may be highly satisfied with the distance to public transportation around social housing communities. With respect to the quantity and efficiency of transportation, residents of communities near the central area may have a higher satisfaction level than those of communities in peripheral areas. In addition, residents in young communities that developed after 2010 may very satisfied with the distance, but hold a slightly negative attitude towards the supply and operative efficiency of their public transportation.

## **6.4 Conclusion**

By briefly concluding on the results of accessing basic facilities (based on survey data for travel time and travel mode) and the results of satisfaction regarding the distance, quantity and quality of facilities (based on respondents' satisfaction level), we can make the following inferences about spatial justice issues in relation to these facilities.

Firstly, most respondents could reach the four MOS within 20 min on foot, and they showed a high level of satisfaction towards the distance between housing and facilities. This may indicate that residents find the spatial layout of the four facilities around social housing communities satisfactory. It may be evidence to show that usually residents in social housing communities may not experience spatial injustice in accessing basic social facilities. Nevertheless, there was a noticeable disparity among surveyed residents in newly built communities after 2010; they showed some disadvantages regarding accessing the first three facilities (nursery and elementary schools, meat and food markets, and convenient supermarkets) and thus reflected with a lower level of satisfaction with the distance. This situation implies the basic services of newly built communities may require certain improvement and residents may also need to adapt to the new environment.

Secondly, respondents perceived that the number of MOS supplied basically met their satisfaction, but the quality of these facilities did not. The lowered satisfaction or even unsatisfied evaluation was significant among respondents of communities that were peripherally located or newly built after 2010. This may indicate that residents in social housing communities (particularly those peripherally located and newly built after 2010) have certain disadvantages to enjoy expected abundant and good services. This may be a sign that most residents of social housing communities experience some injustice in terms of accessing adequate and well-organized facilities to fulfil basic needs.

Tab. 6.8 Percentage of surveyed residents of social housing by travel time to nine facilities, by district and community

	Western Cluster – Liwan District						Middle Cluster – Haizhu District		Eastern Cluster – Tianhe District						Northern Cluster – Baiyun District						Total								
	Fanghe		Dang'en		Guocun		Jude		Tangde		Guangdan		Tai'an		Anxia		Zede		Jinshazhou		Jide		Huize Yaxuan		Likang		Total		
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	
Supporting facility	<b>Nursery and elementary school</b>																												
	<20min	89	89.9	19	95.0	11	91.7	97	99.0	84	84.0	1	5.3	19	100.0	14	70.0	67	81.7	76	76.0	19	95.0	17	89.5	15	71.4	528	83.9
	20-40min	9	9.1	1	5.0	1	8.3	1	1.0	12	12.0	16	84.2	0	0.0	5	25.0	12	14.6	16	16.0	1	5.0	2	10.5	4	19.0	80	12.7
	>40min	1	1.0	0	0.0	0	0.0	0	0.0	4	4.0	2	10.5	0	0.0	1	5.0	3	3.7	8	8.0	0	0.0	0	0.0	2	9.5	21	3.3
	Total	99	100.0	20	100.0	12	100.0	98	100.0	100	100.0	19	100.0	20	100.0	82	100.0	100	100.0	20	100.0	19	100.0	21	100.0	629	100.0		
	<b>Meat and food market</b>																												
	<20min	84	84.0	20	100.0	20	100.0	97	97.0	85	85.0	14	70.0	18	94.7	17	85.0	81	84.4	77	77.8	19	95.0	19	95.0	10	47.6	561	85.6
	20-40min	15	15.0	0	0.0	0	0.0	3	3.0	14	14.0	5	25.0	1	5.3	3	15.0	15	15.6	16	16.2	1	5.0	1	5.0	7	33.3	81	12.4
	>40min	1	1.0	0	0.0	0	0.0	0	0.0	1	1.0	1	5.0	0	0.0	0	0.0	0	0.0	6	6.1	0	0.0	0	0.0	4	19.0	13	2.0
	Total	100	100.0	20	100.0	20	100.0	100	100.0	100	100.0	20	100.0	19	100.0	20	100.0	96	100.0	99	100.0	20	100.0	20	100.0	21	100.0	655	100.0
	<b>Convenience supermarket</b>																												
	<20min	92	92.0	20	100.0	17	94.4	96	96.0	88	88.0	3	15.0	15	78.9	15	75.0	77	78.6	66	66.7	19	95.0	20	100.0	16	76.2	544	83.1
	20-40min	7	7.0	0	0.0	0	0.0	4	4.0	11	11.0	13	65.0	3	15.8	5	25.0	18	18.4	22	22.2	0	0.0	0	0.0	4	19.0	87	13.3
	>40min	1	1.0	0	0.0	1	5.6	0	0.0	1	1.0	4	20.0	1	5.3	0	0.0	3	3.1	11	11.1	1	5.0	0	0.0	1	4.8	24	3.7
	Total	100	100.0	20	100.0	18	100.0	100	100.0	100	100.0	20	100.0	19	100.0	20	100.0	98	100.0	99	100.0	20	100.0	20	100.0	21	100.0	655	100.0
<b>Nearest bus station</b>																													
<20min	96	96.0	20	100.0	20	100.0	99	99.0	86	86.9	19	95.0	17	89.5	20	100.0	93	95.9	73	75.3	19	100.0	19	95.0	16	76.2	597	91.6	
20-40min	3	3.0	0	0.0	0	0.0	1	1.0	11	11.1	1	5.0	1	5.3	0	0.0	4	4.1	21	21.6	0	0.0	0	0.0	4	19.0	46	7.1	
>40min	1	1.0	0	0.0	0	0.0	0	0.0	2	2.0	0	0.0	1	5.3	0	0.0	0	0.0	3	3.1	0	0.0	1	5.0	1	4.8	9	1.4	
Total	100	100.0	20	100.0	20	100.0	100	100.0	99	100.0	20	100.0	19	100.0	20	100.0	97	100.0	97	100.0	19	100.0	20	100.0	21	100.0	652	100.0	
Physical unimproved facilities	<b>Medical facility</b>																												
	<20min	74	74.0	20	100.0	15	78.9	80	80.0	56	56.0	0	0.0	14	73.7	5	25.0	55	58.5	52	52.0	11	55.0	14	70.0	6	28.6	402	61.6
	20-40min	14	14.0	0	0.0	3	15.8	19	19.0	35	35.0	7	35.0	4	21.1	14	70.0	14	14.9	19	19.0	5	25.0	3	15.0	3	14.3	140	21.4
	>40min	12	12.0	0	0.0	1	5.3	1	1.0	9	9.0	13	65.0	1	5.3	1	5.0	25	26.6	29	29.0	4	20.0	3	15.0	12	57.1	111	17.0
	Total	100	100.0	20	100.0	19	100.0	100	100.0	100	100.0	20	100.0	19	100.0	20	100.0	94	100.0	100	100.0	20	100.0	20	100.0	21	100.0	653	100.0
	<b>Middle school</b>																												
	<20min	83	83.8	19	95.0	11	100.0	81	83.5	63	69.2	0	0.0	17	89.5	2	11.8	66	82.5	72	72.0	9	45.0	4	22.2	9	45.0	436	71.5
	20-40min	10	10.1	1	5.0	0	0.0	16	16.5	24	26.4	11	61.1	1	5.3	14	82.4	11	13.8	16	16.0	9	45.0	6	33.3	6	30.0	125	20.5
	>40min	6	6.1	0	0.0	0	0.0	0	0.0	4	4.4	7	38.9	1	5.3	1	5.9	3	3.8	12	12.0	2	10.0	8	44.4	5	25.0	49	8.0
	Total	99	100.0	20	100.0	11	100.0	97	100.0	91	100.0	18	100.0	19	100.0	17	100.0	80	100.0	100	100.0	20	100.0	18	100.0	20	100.0	610	100.0
	<b>Shopping mall</b>																												
	<20min	64	64.0	20	100.0	4	33.3	53	53.5	54	54.5	1	5.0	7	36.8	8	40.0	23	27.1	30	30.3	3	15.0	6	30.0	3	14.3	276	43.5
	20-40min	27	27.0	0	0.0	7	58.3	46	46.5	38	38.4	11	55.0	9	47.4	11	55.0	41	48.2	41	41.4	12	60.0	11	55.0	9	42.9	263	41.5
	>40min	9	9.0	0	0.0	1	8.3	0	0.0	7	7.1	8	40.0	3	15.8	1	5.0	21	24.7	28	28.3	5	25.0	3	15.0	9	42.9	95	15.0
	Total	100	100.0	20	100.0	12	100.0	99	100.0	99	100.0	20	100.0	19	100.0	20	100.0	85	100.0	99	100.0	20	100.0	20	100.0	21	100.0	634	100.0
<b>Nearest park</b>																													
<20min	55	55.0	20	100.0	7	43.8	53	53.5	46	46.5	5	25.0	12	63.2	17	85.0	23	31.9	30	31.6	3	16.7	7	36.8	2	10.5	280	45.5	
20-40min	31	31.0	0	0.0	7	43.8	46	46.5	40	40.4	11	55.0	6	31.6	2	10.0	29	40.3	49	51.6	7	38.9	4	21.1	10	52.6	242	39.3	
>40min	14	14.0	0	0.0	2	12.5	0	0.0	13	13.1	4	20.0	1	5.3	1	5.0	20	27.8	16	16.8	8	44.4	8	42.1	7	36.8	94	15.3	
Total	100	100.0	20	100.0	16	100.0	99	100.0	99	100.0	20	100.0	19	100.0	20	100.0	72	100.0	95	100.0	18	100.0	19	100.0	19	100.0	616	100.0	
<b>Nearest metro station</b>																													
<20min	88	88.0	19	95.0	16	84.2	66	66.7	55	57.3	3	15.0	10	52.6	0	0.0	22	27.8	37	39.4	3	15.0	13	68.4	1	4.8	333	53.2	
20-40min	11	11.0	1	5.0	3	15.8	33	33.3	28	29.2	15	75.0	9	47.4	19	95.0	42	53.2	40	42.6	15	75.0	5	26.3	14	66.7	235	37.5	
>40min	1	1.0	0	0.0	0	0.0	0	0.0	13	13.5	2	10.0	0	0.0	1	5.0	15	19.0	17	18.1	2	10.0	1	5.3	6	28.6	58	9.3	
Total	100	100.0	20	100.0	19	100.0	99	100.0	96	100.0	20	100.0	19	100.0	20	100.0	79	100.0	94	100.0	20	100.0	19	100.0	21	100.0	626	100.0	

Source: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B1 –B9 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

Tab. 6.9 Percentage of surveyed residents of social housing by travel mode to nine facilities, by district and community

	Western Cluster – Liwan District						Middle Cluster – Haizhu District		Eastern Cluster – Tianhe District						Northern Cluster – Baiyun District						Total							
	Fanghe		Dang'en		Guocun		Jude		Tangde		Guangdan		Tai'an		Anxia		Zede		Jinshazhou				Jide		Huize Yaxuan		Likang	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%		
<b>Nursery and elementary school</b>																												
by foot	99	100.0	20	100.0	11	91.7	98	100.0	92	92.0	8	42.1	18	94.7	17	85.0	73	89.0	85	85.0	19	95.0	15	78.9	10	47.6	565	89.8
by bicycle	0	0.0	0	0.0	0	0.0	0	0.0	2	2.0	1	5.3	1	5.3	2	10.0	0	0.0	8	8.0	0	0.0	3	15.8	5	23.8	22	3.5
by mopeds	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	2.0	0	0.0	0	0.0	2	9.5	4	.6
by bus or metro	0	0.0	0	0.0	1	8.3	0	0.0	4	4.0	8	42.1	0	0.0	1	5.0	8	9.8	3	3.0	1	5.0	1	5.3	4	19.0	31	4.9
by car	0	0.0	0	0.0	0	0.0	0	0.0	2	2.0	2	10.5	0	0.0	0	0.0	1	1.2	2	2.0	0	0.0	0	0.0	0	0.0	7	1.1
Total	99	100.0	20	100.0	12	100.0	98	100.0	100	100.0	19	100.0	19	100.0	20	100.0	82	100.0	100	100.0	20	100.0	19	100.0	21	100.0	629	100.0
<b>Meat and food market</b>																												
by foot	98	98.0	20	100.0	20	100.0	100	100.0	95	95.0	18	90.0	15	78.9	16	80.0	91	94.8	87	87.9	20	100.0	20	100.0	8	38.1	608	92.8
by bicycle	0	0.0	0	0.0	0	0.0	0	0.0	3	3.0	1	5.0	4	21.1	4	20.0	1	1.0	6	6.1	0	0.0	0	0.0	6	28.6	25	3.8
by mopeds	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	1.0	2	2.0	0	0.0	0	0.0	1	4.8	4	.6
by bus or metro	2	2.0	0	0.0	0	0.0	0	0.0	2	2.0	0	0.0	0	0.0	0	0.0	3	3.1	3	3.0	0	0.0	0	0.0	5	23.8	15	2.3
by car	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	5.0	0	0.0	0	0.0	0	0.0	1	1.0	0	0.0	0	0.0	1	4.8	3	.5
Total	100	100.0	20	100.0	20	100.0	100	100.0	100	100.0	20	100.0	19	100.0	20	100.0	96	100.0	99	100.0	20	100.0	20	100.0	21	100.0	655	100.0
<b>Convenience supermarket</b>																												
by foot	98	98.0	20	100.0	18	100.0	99	99.0	93	93.0	7	35.0	15	78.9	16	80.0	86	87.8	77	77.8	19	95.0	20	100.0	13	61.9	581	88.7
by bicycle	0	0.0	0	0.0	0	0.0	0	0.0	4	4.0	1	5.0	2	10.5	4	20.0	1	1.0	8	8.1	0	0.0	0	0.0	3	14.3	23	3.5
by mopeds	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	1.0	4	4.0	0	0.0	0	0.0	1	4.8	6	.9
by bus or metro	2	2.0	0	0.0	0	0.0	1	1.0	3	3.0	10	50.0	2	10.5	0	0.0	10	10.2	7	7.1	1	5.0	0	0.0	3	14.3	39	6.0
by car	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	10.0	0	0.0	0	0.0	0	0.0	3	3.0	0	0.0	0	0.0	1	4.8	6	.9
Total	100	100.0	20	100.0	18	100.0	100	100.0	100	100.0	20	100.0	19	100.0	20	100.0	98	100.0	99	100.0	20	100.0	20	100.0	21	100.0	655	100.0
<b>Nearest bus station</b>																												
by foot	100	100.0	20	100.0	20	100.0	100	100.0	93	93.9	19	95.0	18	94.7	20	100.0	95	97.9	89	91.8	19	100.0	19	95.0	16	76.2	628	96.3
by bicycle	0	0.0	0	0.0	0	0.0	0	0.0	5	5.1	0	0.0	1	5.3	0	0.0	1	1.0	4	4.1	0	0.0	1	5.0	3	14.3	15	2.3
by mopeds	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	2.1	0	0.0	0	0.0	1	4.8	3	.5
by bus or metro	0	0.0	0	0.0	0	0.0	0	0.0	1	1.0	0	0.0	0	0.0	0	0.0	1	1.0	1	1.0	0	0.0	0	0.0	0	0.0	3	.5
by car	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	5.0	0	0.0	0	0.0	0	0.0	1	1.0	0	0.0	0	0.0	1	4.8	3	.5
Total	100	100.0	20	100.0	20	100.0	100	100.0	99	100.0	20	100.0	19	100.0	20	100.0	97	100.0	97	100.0	19	100.0	20	100.0	21	100.0	652	100.0
<b>Medical facility</b>																												
by foot	77	77.0	18	90.0	14	73.7	78	78.0	49	49.0	4	20.0	7	36.8	18	90.0	58	61.7	63	63.0	12	60.0	9	45.0	1	4.8	408	62.5
by bicycle	1	1.0	0	0.0	0	0.0	0	0.0	6	6.0	1	5.0	3	15.8	2	10.0	0	0.0	5	5.0	0	0.0	1	5.0	5	23.8	24	3.7
by mopeds	0	0.0	0	0.0	0	0.0	0	0.0	1	1.0	0	0.0	0	0.0	0	0.0	1	1.1	4	4.0	0	0.0	2	10.0	1	4.8	9	1.4
by bus or metro	21	21.0	0	0.0	5	26.3	22	22.0	40	40.0	13	65.0	7	36.8	0	0.0	32	34.0	19	19.0	8	40.0	8	40.0	9	42.9	184	28.2
by car	1	1.0	2	10.0	0	0.0	0	0.0	4	4.0	2	10.0	2	10.5	0	0.0	3	3.2	9	9.0	0	0.0	0	0.0	5	23.8	28	4.3
Total	100	100.0	20	100.0	19	100.0	100	100.0	100	100.0	20	100.0	19	100.0	20	100.0	94	100.0	100	100.0	20	100.0	20	100.0	21	100.0	653	100.0
<b>Middle school</b>																												
by foot	96	97.0	20	100.0	10	90.9	80	82.5	69	75.8	6	33.3	18	94.7	5	29.4	71	88.8	76	76.0	12	60.0	2	11.1	6	30.0	471	77.2
by bicycle	0	0.0	0	0.0	0	0.0	1	1.0	8	8.8	1	5.6	1	5.3	3	17.6	0	0.0	8	8.0	0	0.0	3	16.7	7	35.0	32	5.2
by mopeds	0	0.0	0	0.0	0	0.0	1	1.0	0	0.0	1	5.6	0	0.0	0	0.0	0	0.0	3	3.0	0	0.0	0	0.0	2	10.0	7	1.1
by bus or metro	3	3.0	0	0.0	1	9.1	15	15.5	12	13.2	9	50.0	0	0.0	9	52.9	8	10.0	10	10.0	8	40.0	13	72.2	5	25.0	93	15.2
by car	0	0.0	0	0.0	0	0.0	0	0.0	2	2.2	1	5.6	0	0.0	0	0.0	1	1.3	3	3.0	0	0.0	0	0.0	0	0.0	7	1.1
Total	99	100.0	20	100.0	11	100.0	97	100.0	91	100.0	18	100.0	19	100.0	17	100.0	80	100.0	100	100.0	20	100.0	18	100.0	20	100.0	610	100.0
<b>Shopping mall</b>																												
by foot	62	62.0	20	100.0	3	25.0	13	13.1	64	64.6	3	15.0	12	63.2	4	20.0	17	20.0	45	45.5	4	20.0	3	15.0	1	4.8	251	39.6
by bicycle	0	0.0	0	0.0	0	0.0	6	6.1	6	6.1	1	5.0	1	5.3	7	35.0	0	0.0	19	19.2	0	0.0	1	5.0	3	14.3	44	6.9
by mopeds	0	0.0	0	0.0	0	0.0	2	2.0	3	3.0	0	0.0	0	0.0	0	0.0	0	0.0	3	3.0	0	0.0	0	0.0	1	4.8	9	1.4
by bus or metro	38	38.0	0	0.0	5	41.7	77	77.8	24	24.2	14	70.0	6	31.6	9	45.0	63	74.1	28	28.3	15	75.0	16	80.0	13	61.9	308	48.6
by car	0	0.0	0	0.0	4	33.3	1	1.0	2	2.0	2	10.0	0	0.0	0	0.0	5	5.9	4	4.0	1	5.0	0	0.0	3	14.3	22	3.5
Total	100	100.0	20	100.0	12	100.0	99	100.0	99	100.0	20	100.0	19	100.0	20	100.0	85	100.0	99	100.0	20	100.0	20	100.0	21	100.0	634	100.0
<b>Nearest park</b>																												
by foot	48	48.0	20	100.0	6	37.5	72	72.7	41	41.4	5	25.0	7	36.8	18	90.0	22	30.6	58	61.1	1	5.6	0	0.0	1	5.3	299	48.5
by bicycle	3	3.0	0	0.0	0	0.0	4	4.0	8	8.1	1	5.0	1	5.3	0	0.0	0	0.0	11	11.6	0	0.0	1	5.3	5	26.3	34	5.5
by mopeds	0	0.0	0	0.0	0	0.0	0	0.0	4	4.0	0	0.0	0	0.0	0	0.0	0	0.0	4	4.2	0	0.0	0	0.0	1	5.3	9	1.5

## 6 Classification of facilities and accessibility of basic social facilities

by bus or metro	48	48.0	0	0.0	6	37.5	22	22.2	43	43.4	12	60.0	11	57.9	1	5.0	46	63.9	16	16.8	16	88.9	18	94.7	11	57.9	250	40.6
by car	1	1.0	0	0.0	4	25.0	1	1.0	3	3.0	2	10.0	0	0.0	1	5.0	4	5.6	6	6.3	1	5.6	0	0.0	1	5.3	24	3.9
Total	100	100.0	20	100.0	16	100.0	99	100.0	99	100.0	20	100.0	19	100.0	20	100.0	72	100.0	95	100.0	18	100.0	19	100.0	19	100.0	616	100.0
<b>Nearest metro station</b>																												
by foot	100	100.0	20	100.0	17	89.5	53	53.5	29	30.2	8	40.0	15	78.9	3	15.0	5	6.3	51	54.3	0	0.0	12	63.2	1	4.8	314	50.2
by bicycle	0	0.0	0	0.0	1	5.3	1	1.0	6	6.3	1	5.0	1	5.3	3	15.0	0	0.0	4	4.3	0	0.0	2	10.5	4	19.0	23	3.7
by mopeds	0	0.0	0	0.0	0	0.0	0	0.0	2	2.1	2	10.0	0	0.0	0	0.0	1	1.3	3	3.2	0	0.0	0	0.0	1	4.8	9	1.4
by bus or metro	0	0.0	0	0.0	1	5.3	45	45.5	56	58.3	7	35.0	3	15.8	14	70.0	71	89.9	30	31.9	19	95.0	5	26.3	12	57.1	263	42.0
by car	0	0.0	0	0.0	0	0.0	0	0.0	3	3.1	2	10.0	0	0.0	0	0.0	2	2.5	6	6.4	1	5.0	0	0.0	3	14.3	17	2.7
Total	100	100.0	20	100.0	19	100.0	99	100.0	96	100.0	20	100.0	19	100.0	20	100.0	79	100.0	94	100.0	20	100.0	19	100.0	21	100.0	626	100.0

Source: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B1 –B9 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

## 7 Accessibility of public healthcare, education, shopping and transportation facilities

### A question of spatial injustice or location economics? A social science survey and GIS-based analysis

In many studies, the functions and services of facilities within a certain area are commonly explained by issues related to the availability of a facility and the measurement of accessibility. Availability analyses focus on examining the quantity or density of opportunities available to respondents; many of them make use of methods like the kernel density to compute nearby objects (Porta et al., 2009; Moore et al., 2008a). Assessments of accessibility of services is commonly based on the geographic distance or the travel distance to destinations within a defined area (Farhan & Murray, 2005).

A widely used method, two-step floating catchment area (2SFCA) (Radke & Mu, 2000; Luo & Wang, 2003; Roux, et al., 2007; Munoz & Källestal, 2012; Tao, et al., 2014; Ikram et al., 2015), analyses spatial accessibility as a ratio of available facilities to population in the catchment area (which is defined by the threshold of travel time: the accessible area that can be reached within a certain travel time is included in the calculation; locations outside the accessible area are excluded). There are two main processes involved: firstly, to calculate the ratio of the supply of a facility to its surrounding population within the catchment, then to sum up all ratios that load at every demand location for the final result. Recently, some enhanced-2SFCA (E2SFCA) models have considered using a gravity model to calculate distance decay by weighting different zones within catchment (Luo, 2009; Ni, et al., 2015). The near locations are more benefited by the facility than locations that are located at a greater distance. Adding the gravity model in 2SFCA stimulates this spatial interaction between the facility and surrounded locations. In this sense, to explain accessibility the 2SFCA method considers both the available supply of facilities and the travel distance. The advantage of 2SFCA makes it suitable for measuring accessibility to healthcare facilities, jobs and food environment. Because accessing these facilities, people not only consider the location but also the attractiveness (e.g. specific conditions of medical facilities, and skills of physicians).

The aim of evaluating accessibility in this study is to find out if the distribution of facilities around a social housing community achieves spatial justice, so it is very important to consider the distance, supply of services and individual perceptions in this analysis. In addition to analysing the travel time to reach the facility, we selected 2SFCA as the main way for explaining accessible supply of medical facilities, middle schools, shopping malls, parks and metro stations. At the same time, we enhanced the 2SFCA method using the gravity model to define the influences of supply which decline as distance increases.

#### 7.1 The 2SFCA method and data preparation

##### 7.1.1 Introduction of the 2SFCA approach

Using the two-step floating catchment area (2SFCA) approach firstly requires an assumed threshold based on travel time. Then the surrounding area that can be reached within the threshold travel time is viewed as the catchment (service area) for the central location. The population surrounding this catchment are regarded as the people demanding the centrally located service, and each place in the catchment is defined as a demand location. The accessibility of demand location  $i$  is represented as  $A_i$ , an accumulative ratio of the supply of facilities to population (Luo & Wang, 2003: 872; Tao & Cheng, 2016: 590):

$$A_i = \sum_{j \in \{d_{ij} \leq d_0\}} \frac{S_j}{\sum_{k \in \{d_{kj} \leq d_0\}} P_k} \quad \text{Equation 1}$$

$i$  is a demand location,  $j$  is the location of service,  $k$  is a demand location within the catchment area of  $j$ ;  $d_0$  is the distance that can be reached within the threshold travel time,  $d_{ij}$  refers to the travel distance between location  $i$  and  $j$ , and  $d_{kj}$  is the travel distance between  $k$  and  $j$ ;  $S_j$  is the supply (quantity) of the service  $j$ ;  $P_k$  is the population of  $k$ .

The calculation operates in two steps, the first step is centred on the location of the service  $j$ , to compute the supply-to-population ratio of every demand location  $i$  that is within the catchment. The second step is centred on every demand

location to sum up all ratios that load on it for a final accessibility score of location  $i$ . The larger the value of  $A_i$ , the better the accessibility of location  $i$  to the service.

### 7.1.1.1 Gravity-based accessibility of 2SFCA

In 2SFCA the use of a suitable model for distance decay is critical. The classical calculation only sets a threshold to define the catchment without considering interaction between the demand location and the service across the area. So demand locations are divided into two groups, and only those in the catchment area are involved and are regarded equally. This means that no matter how near or far to the service location, all demand locations within the catchment area are assumed to have an equal spatial interaction. However, the service is more favourable and more attractive to the population in demand locations within a short distance, than those in remote locations at a long distance. The interaction between the service location and demand locations declines as distance increases. The classic method would fail to describe this rule. An enhanced 2SFCA method adopts some models to define the spatial interaction between the population and the service. After modifying the 2SFCA method using distance decay, the accessibility function is (Luo, 2009: 1101):

$$A_i^G = \sum_{j=1}^n \frac{S_j f(d_{ij})}{\sum_{k=1}^m D_k f(d_{kj})} \quad \text{Equation 2}$$

$A_i^G$  is the distance decay-based accessibility of the demand location  $i$ ,  $S_j$  is the supply potential of the service location  $j$ ,  $D_k$  is demand scale (e.g. population) of the demand location  $k$ .  $f(d_{ij})$  is the distance decay function between demand location  $i$  and supply location  $j$ , similarly,  $f(d_{kj})$  presents the distance decay function between locations  $k$  and  $j$ . Number  $n$  and  $m$  mean the total number of service locations and demand locations respectively.

#### Gravity-based distance decay model

The discussion of the principles of distance decay can be traced back to the 1970s (Claeson, 1968; Olsson, 1967; Gale, 1967; Harvey, 1967) when geographic interaction was broadly discussed. Several methods have been used to simulate the principle of distance decay. The various models contain the popular gravity model (Wang & Luo, 2005; Wang & Tang, 2013; Wang, 2012; Tao, et al., 2014; Reggiani et al. 2011; Signorino et al., 2011; Alonso et al., 2014; Bauer & Groneber, 2016; Gitlesen et al., 2010), the kernel density model (Dai & Wang, 2011), and Gaussian-based model (also referred to as the potential model, which is calculated by a power-exponential function:  $f(d_{ij}) = \exp(-\alpha \cdot d_{ij}^\beta)$ ) (Dai, 2011; Salze et al., 2011; Luo & Qi, 2009; Halas & Klapka, 2015). Though decay takes place in different way, these models assume that each centre point has a local influence that diminishes with distance. They give greater weight to demand locations that are near the predicted service, and smaller weight to locations that are distant from the service location (Tao & Cheng, 2016). Meanwhile, both social gravity and geographic features are involved in these models (see in Equation 3).

$$I_{ij} = f(P_i, P_j, D_{ij}) \quad \text{Equation 3}$$

$I_{ij}$  refers to the interaction between place  $i$  and  $j$

$P_i$  and  $P_j$  represent social factors (e.g. population size etc.) of place  $i$  and  $j$  respectively

$D_{ij}$  is the distance between place  $i$  and  $j$

Among the models, the gravity model is mainly used one to define distance decay. Hence, we enhance the method of 2SFCA with the gravity model. The interaction between demand location  $i$  and the service location  $j$  is computed by this function (Tao & Cheng, 2016: 591, Luo & Wang, 2003: 873):

$$f(d_{ij}) = d_{ij}^{-\beta}, \quad d_{ij} \leq d_o \quad \text{Equation 4}$$

$\beta$  is the distance decay parameter (traffic-friction coefficient),  $d_{ij}$  is the travel distance between demand location  $i$  and service location  $j$ ; and  $d_o$  is the distance that can be reached within the threshold travel time. It is notable when  $d_{ij} \leq d_o$ ,  $\beta$  is a constant, and when  $d_{ij} > d_o$ ,  $\beta$  is assigned with “ $\infty$ ” then  $f(d_{ij})$  is 0. In the model, the distance is supposed as a deterrent to interaction, when all other factors are defined as constant (Fotheringham, 1981). Therefore, the distance

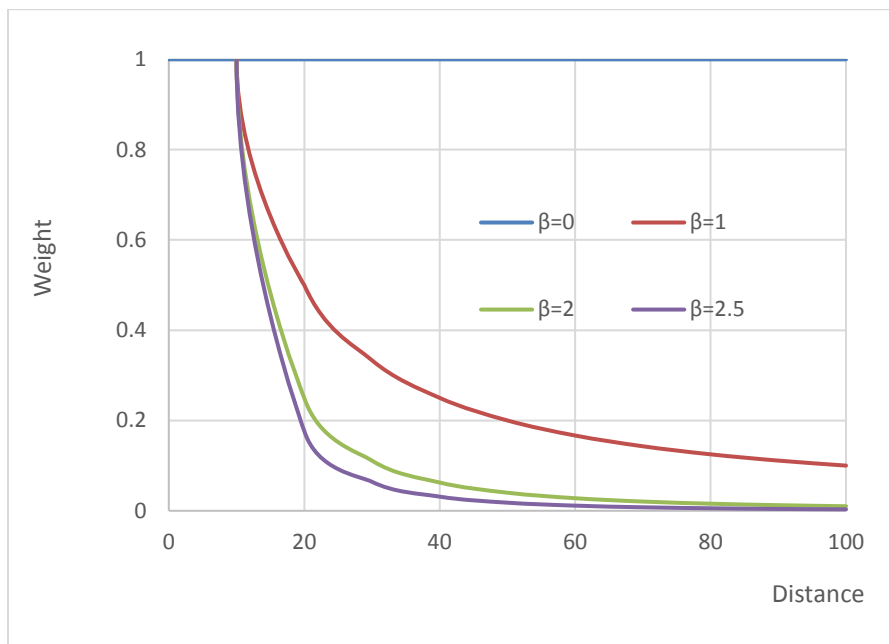
decay parameter  $\beta$  rules the gravity model: a high value of the parameter indicates that the interaction declines as the distance increases, and vice versa.

To induce  $f(d_{ij})$  into Equation 2, the final function of the gravity-based index of accessibility is:

$$A_i^G = \sum_{j=1}^n \frac{S_j d_{ij}^{-\beta}}{\sum_{k=1}^m D_k d_{kj}^{-\beta}} \quad \text{Equation 5}$$

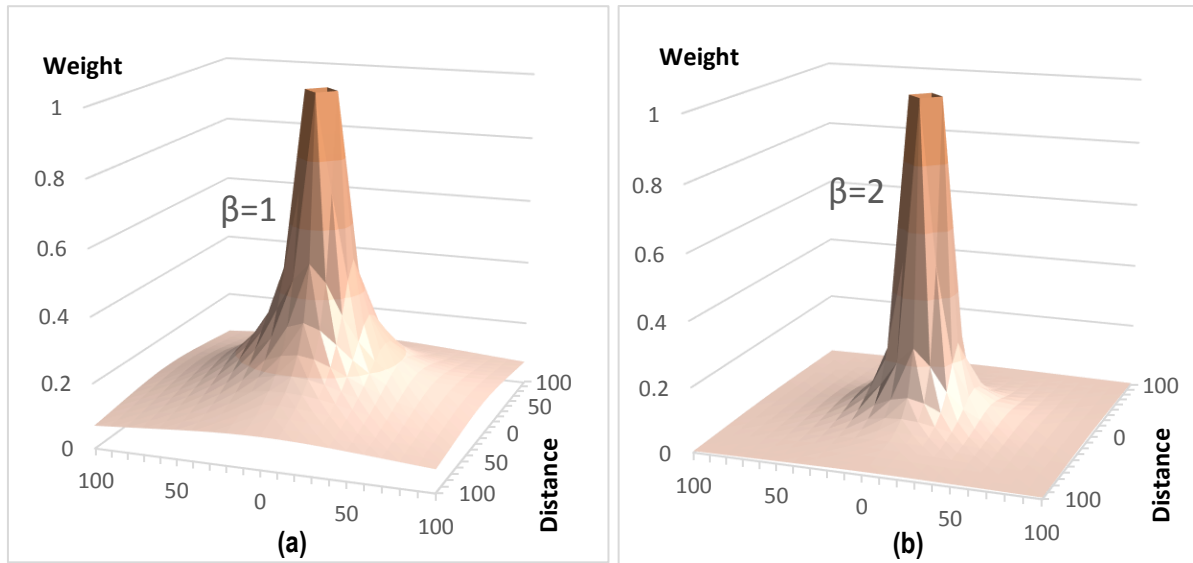
### The distance decay parameter: $\beta$ -value

The distance decay parameter  $\beta$  is also called the traffic friction coefficient. The rate of decline as distance increases in the gravity model is determined by the  $\beta$ -value (see Equation 4). The inverse decay is centred on the service location, and extends to the surrounding demand locations. As distance increases the weight reduces. The closest demand location is weighted higher and the more remote location is weighted lower. The larger  $\beta$  value implies higher traffic friction, while the weight along with distance increase show a sharp decline (see Fig.7.1). The central service has strong attraction for nearby demand locations, but this attraction decreases sharply to a low level for distant demand locations. Meanwhile, the smaller  $\beta$  value represents a slower decrease with an increase in distance. In order to simulate this inverse decay, we use weighted value as the “z” axis, and depict how surrounding locations of a central location are weighted on the surface (see Fig.7.2). This result is shown in a bell shape. The small parameter (see Fig.7.2 (a)) presents a gradually decline while the large decay parameter  $\beta$  (see Fig.7.2 (b)) indicates a steeper decline. A demand location is weighted with a smaller value when using a large parameter  $\beta$ , which implies strong traffic friction.



**Fig. 7.1 Diagram of inverse distance weight in the gravity model**

Source: quote Fig 4-75 Inverse distance decay,  $\alpha/d^\beta$ , Geospatial Analysis 6th Edition, 2018.



**Fig. 7.2 The inverse weighting on a spatial surface by the gravity model**

Source: own draft, 2017, according to data: Fig 4-75 Inverse distance decay,  $a/d^\beta$ , Geospatial Analysis 6th Edition, 2018.

### 7.1.1.2 Defining the distance decay parameter and the threshold travel time

**Defining the distance decay parameter  $\beta$ .** Defining the parameter  $\beta$  is important, as it directly decides the value of accessibility. The parameter not only changes with distance but also with various aspects like quantity of supply, traffic conditions and so on. A travel-friction coefficient with a larger value implies that people are discouraged from travelling farther to the service (Luo & Wang, 2003: 875). To review previous results, some studies selected a fixed value according to experiences (Luo & Wang, 2003; Wang & Tang, 2013), while others define the value by mathematical analysis of the specific situations (Wang, 2000; Tiefelsdorf, 2003; Hammond, 2011; Griffith & Fischer, 2013; Lenormand, Huet & Gargiulo, 2012). Using an experience-based value usually starts with a sensitivity test and then a reasonable parameter is chosen. For example, Luo and Wang (2003: 875) examined the values ranging from 1.0 to 2.2, and Wang and Tang (2013: 10) tested the values ranging from 0.6 to 1.8. Both of these selected the minimum value (1.0 and 0.6 respectively) as the traffic-friction coefficient for primary health care. Several studies have defined the value using mathematical analysis. In a study of job-commuting in Chicago, Wang (2000) used the value of 1.85. The author adjusted the  $\beta$ -value until the mean of accessibility matched the actual commuting distance. In addition, some studies have examined the specifications of models and have explored reasonable indexes to adjust to different conditions (Tiefelsdorf, 2003; Hammond, 2011; Griffith & Fischer, 2013). In a study of commuting accessibility, Lenormand, Huet & Gargiulo (2012) gave a particular  $\beta$  value to each job destination based on the number of commuters within a geographic unit and spatial distance. Many others make use of a regression model of spatial interaction and distance to explore the parameters.

In essence, the parameters between each pair of places are different and estimating the value of  $\beta$  is more suitable for those studies with a small number of cases. Our study has 1309 primary hospitals and 116 sub districts, and 23,526 cases included when setting 20 min travel time as the threshold, hence the use of regression to define particular parameters is unrealistic. Similar to a number of other studies (Luo & Wang, 2003; Wang, 2000), we decided to use an experiential fixed value for  $\beta$  in the gravity model by summarizing experiences from previous studies. Generally,  $\beta$  occupies interval [0.8, 2.5]. The steeper distance decay weight (e.g.  $\beta = 2.5$ ) identifies a smaller and more concentrated demand area, whereas the slower distance decay weight (e.g.  $\beta = 0.8$ ) identifies a broader area (Luo & Qi, 2009: 1104). It would be a good choice to use a small value in estimating rare resources like the cancer care facility and use a large value for basic pharmacy facilities. In the study about the accessibility of primary physicians in northern Illinois, Luo and Qi (2009: 1104) suggested allocating the resource to where they were most needed and select “1” as the  $\beta$ -value. Other studies of accessibility to primary healthcare set the value around “1” (Luo & Wang, 2003; Wang & Tang, 2013). Hence, our study here assigns the parameter with value “1” as the power of inverse distance function. And a sensitivity analysis of accessibility scores with  $\beta$ -values ranging from 0.8 to 2.0 (with an increment of 0.2). Indeed, the result verified that



larger  $\beta$ -values (traffic friction) have a lower standard deviation, which means that the association between the population at the demand location and services declined as the travel time increased (see Tab.7.1).

**Tab. 7.1 Sensitivity analysis of accessibility measure**

Gravity-based method	
Travel-friction coefficient $\beta$	Standard deviation of $A_i^G$
0.8	0.0006988228
1.0	0.0001401496
1.2	0.0000288011
1.4	0.0000060634
1.6	0.0000013064
1.8	0.0000002879
2.0	0.0000000651

Source: own draft, based on ArcGIS database.

**Setting the threshold travel time  $d_0$ .** The key presumption of this model is defining the threshold travel time  $d_0$ , on which the measurement of the travel distance is based. Lee (1991: 440) suggested using 30 minutes in primary road conditions as the threshold for reaching primary medical cares. Luo and Wang (2003: 875) have set seven thresholds ranging between 20 and 50 minutes. Since most locations of social housing communities in our study lie in suburban areas, they may be excluded when setting a smaller search radius. Consequently, similar to the intervals that are selected in the questionnaire, we set two threshold travel times  $d_0$ : one is 20 min by walking and another is 20 min by bus. These two thresholds are consistent with the intervals of the surveyed questionnaire, which would be convenient for further comparative analysis.

### 7.1.2 Data preparation for 2SFCA

Our study focuses on services in the centrally located districts (i.e. Liwan, Yuexiu, Haizhu, Tianhe, Baiyun, Huangpu and Luogang), which include 116 sub districts and a total population of 8,101,691 (see Fig.7.3). The population data for each sub district is taken from the sixth census of Guangzhou, 2010. Since the smallest geographic unit of the census is the sub district (*She Qu*), we draw the areas of every sub district in a polygon-feature layer. The study then calculated the centroid of each sub district and then assigned the population to these centroids. With respect to services, we built point-feature layers for medical facilities, middle schools, metro stations and shopping malls. In addition, the supply of hospitals, like the quantity of physicians and available beds, was collected from Internet resources and is given to points. Then, we converted these feature layers to polygons and points into raster forms for further calculations of distance decay.

Spatial Analyst/Interpolation/IDW (inverse distance weighted) tool was used to give the value of the centroids (population centroids and facilities centroids) to their surrounded grids. The function of IDW gives the values to neighbouring grids according to the rule of distance decay weighting. To ensure accuracy as far as possible, we define the size of a grid as 1 m<sup>2</sup> in real area. We then compute “population”, “physicians of key hospital” and “physicians of primary health care”<sup>12</sup> in the gravity model with a distance decay parameter of “-1” to assign values to the surrounding grids of the centroid. Then, the threshold travel time  $d_0$  is set in the function of the search radius. As we defined 20 minutes by walking (see Fig.7.4- Fig.7.6) and 20 minutes by bus (see Fig.7.7- Fig.7.9) as the thresholds, this give a distances of approximately 1400 metres and 7000 metres respectively. Normal walking speed of human beings is 3–5 km/h, bus speed in the city area of Guangzhou is 15–25 km/h. We therefore use 4.2 km/h and 21 km/h as the speed of walking and travelling by bus respectively.

The value of the surrounding grids is calculated using this function (see Equation 6):

<sup>12</sup> The primary medical facility refers to all basic healthcare facilities, which include clinics and hospitals. Key medical facilities in our study are defined as hospitals with official designation: A hospitals (*Yi Jia* hospitals), AA hospitals (*Er Jia* hospitals) and AAA hospitals (*San Jia* hospitals) (The classification of the primary and the key medical facilities is self-defined in this study).

$$V_i^R = \frac{d_{ij}^{-\beta}}{\sum_{j=1}^n d_{ij}^{-\beta}} \quad \text{Equation 6}$$

$V_i^R$  is the value of grid  $i$ ;  $d_{ij}$  is the distance between grid  $i$  and  $j$ ;  $n$  refers to the number of grid  $j$  that lies within threshold travel time;  $\beta$  is the distance decay parameter.

Therefore, the accessible supply of grid  $i$  is calculated using equation 7, and the demand population of grid  $i$  is calculated using equation 8:

$$S_i^R = \sum_{j=1}^n \frac{S_j d_{ij}^{-\beta}}{\sum_{j=1}^n d_{ij}^{-\beta}} \quad \text{Equation 7}$$

$$P_i^R = \sum_{k=1}^m \frac{P_k d_{ik}^{-\beta}}{\sum_{k=1}^m d_{ik}^{-\beta}} \quad \text{Equation 8}$$

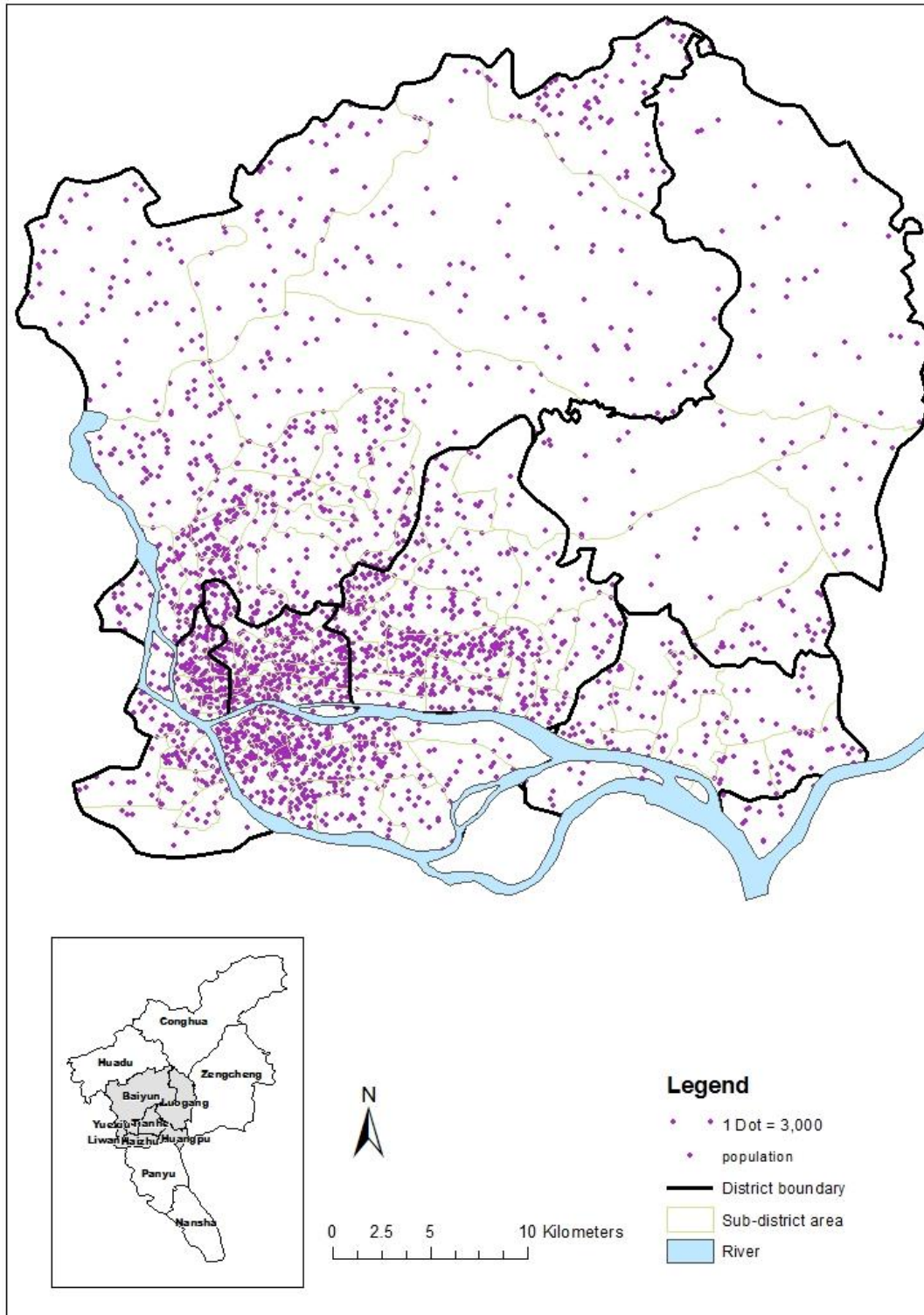
$S_i^R$  is the value of the accessible supply of grid  $i$ ;  $P_i^R$  is the value of the demand population of grid  $j$ ;  $n$  is the total amount of grids within the threshold travel time to the facility location; and  $m$  is the total number of grids within the threshold travel time of the population centroid.

Then, the accessibility of grid  $i$  is the ratio of  $S_i^R$  to  $P_i^R$  (see Equation 9):

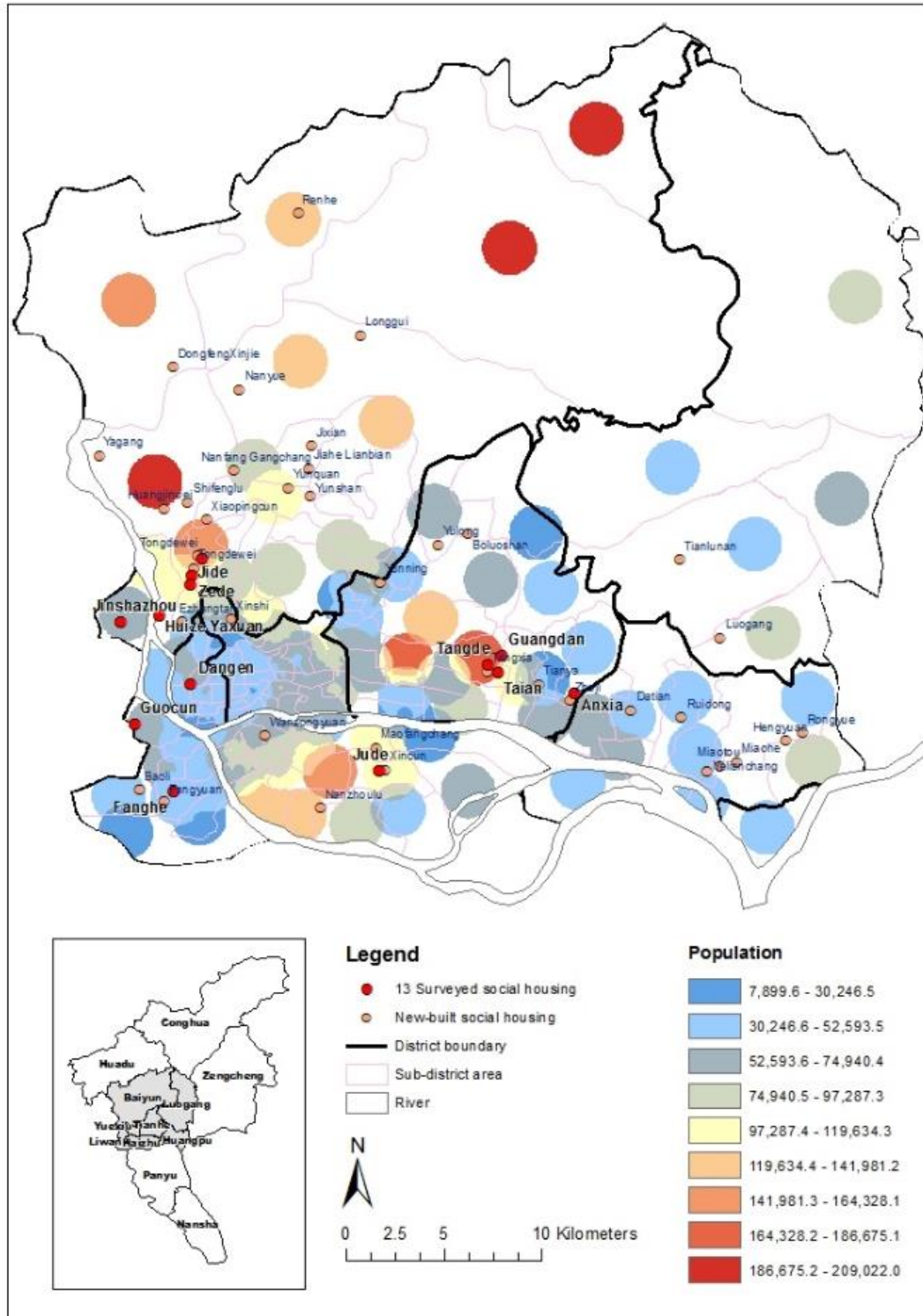
$$A_i^R = \frac{S_i^R}{P_i^R} = \frac{\sum_{j=1}^n S_j d_{ij}^{-\beta}}{\sum_{j=1}^n d_{ij}^{-\beta}} \cdot \frac{\sum_{k=1}^m d_{ik}^{-\beta}}{\sum_{k=1}^m P_k d_{ik}^{-\beta}} \quad \text{Equation 9}$$

Both facilities and population use the same grid size and the same threshold travel time  $d_0$ , so  $n$  is equal to  $m$ . Then Equation 9 can be simplified to Equation 10, which is exactly the same as the function of  $A_i^G$  in Equation 5. Using analysis with raster layers can fulfil the calculation of the accessibility score of demand location  $i$ :

$$A_i^R = \frac{\sum_{j=1}^n S_j d_{ij}^{-\beta}}{\sum_{k=1}^m P_k d_{ik}^{-\beta}} = A_i^G \quad \text{Equation 10}$$



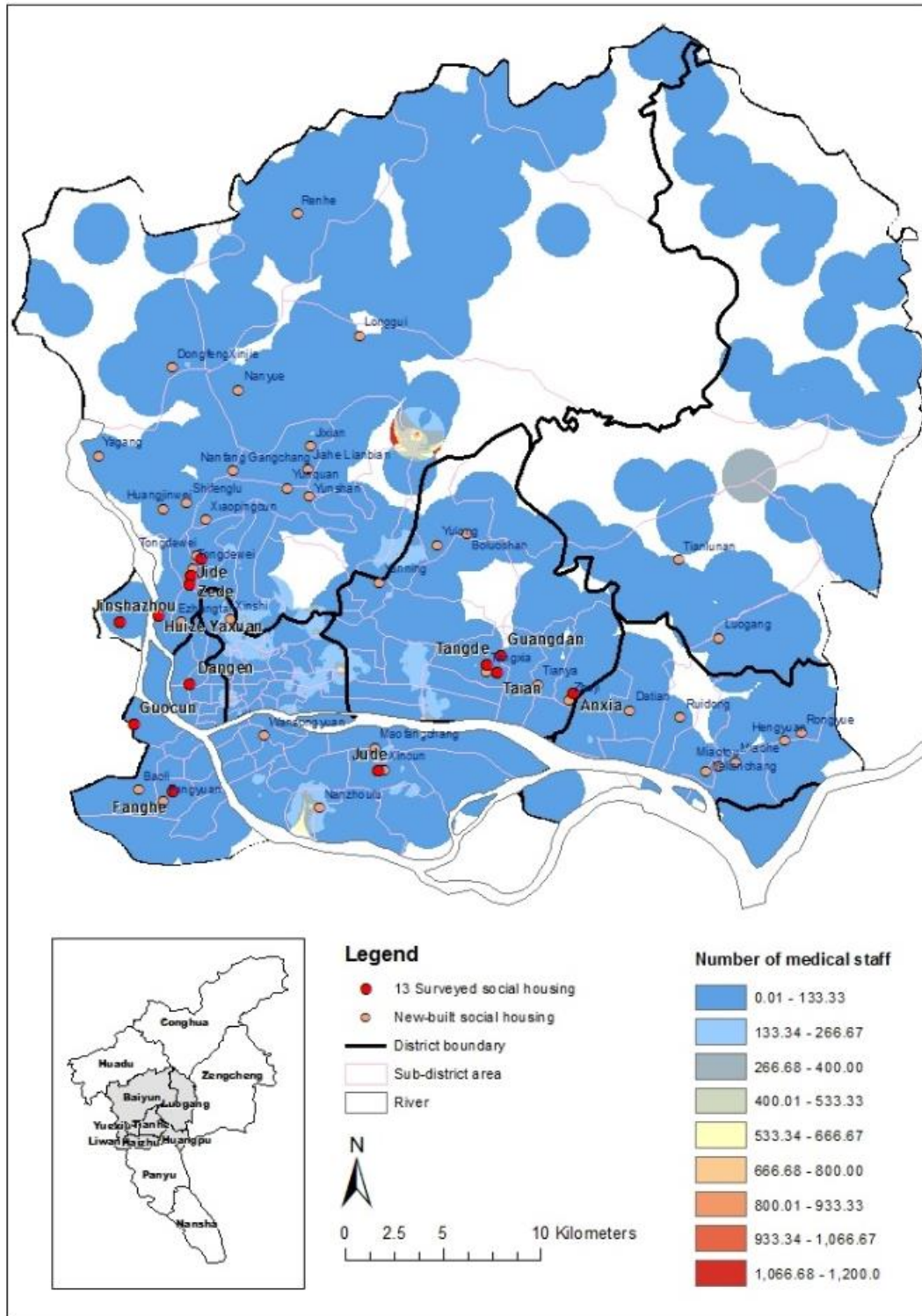
**Fig. 7.3** Dot density of population of sub district area, Guangzhou  
 Source: own draft, 2017. Data source: Sixth Census Data of Guangzhou, 2010.



**Fig. 7.4 The distribution of the population, by distance decay to weight areas within the threshold travel time  $d_0 = 20$  min by walking, Guangzhou**

Note: Using the tool IDW (inverse distance decay) of ArcGIS: the decay parameter is "1" and the threshold travel time is 20 min by walking (around 1400 metres) in travel conditions of Guangzhou road system.

Source: own draft, 2017. Map database: GIS database of boundaries, routes of Guangzhou, Sun-Yat sen University, 2013. Population database: the Sixth census of Guangzhou, 2010. Location and supply of medical facilities: <https://map.baidu.com/>; <http://yyk.99.com.cn/guangzhou/> [access on June, 2017].

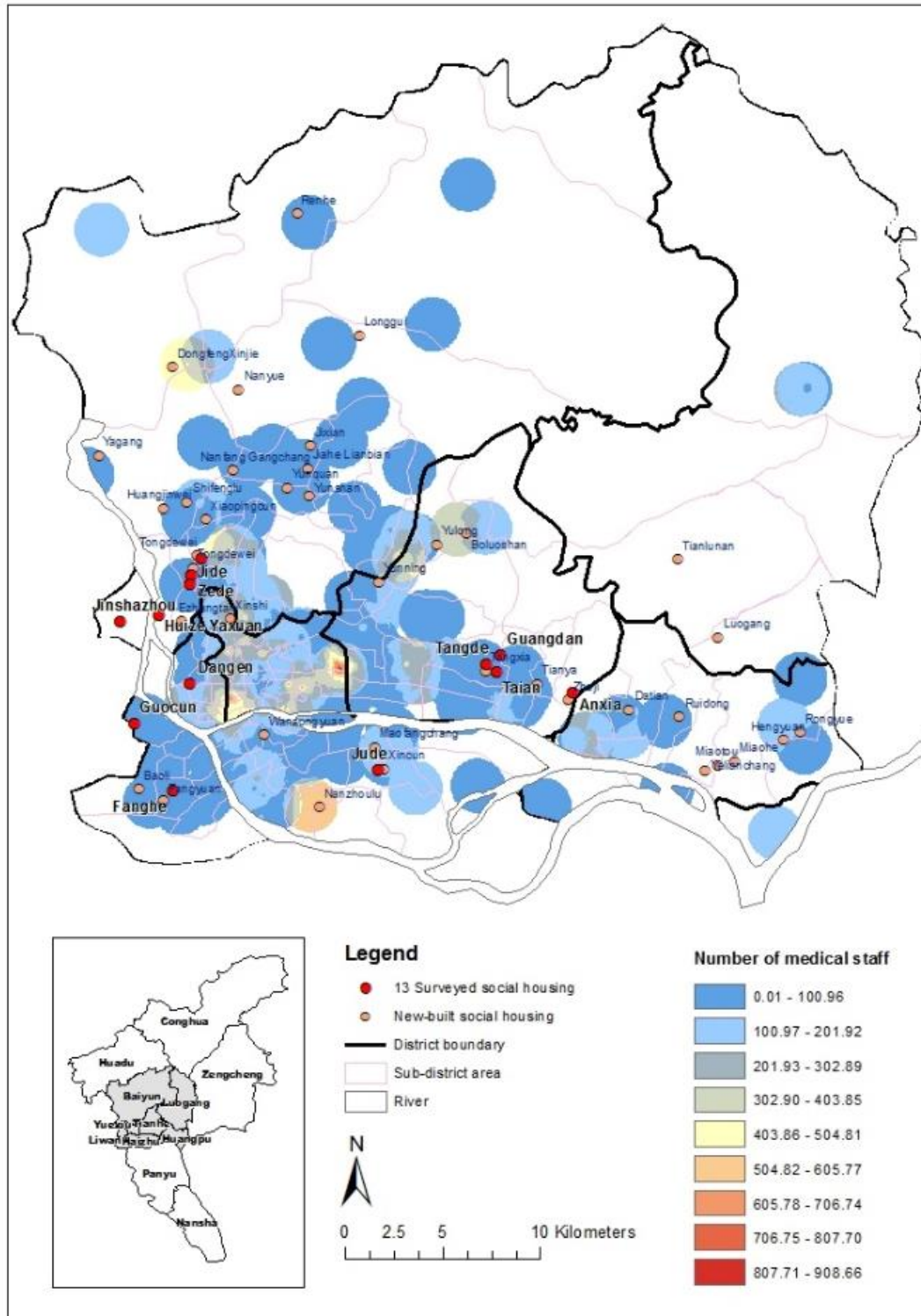


**Fig. 7.5 Accessible physicians at primary healthcare facilities, by distance decay to weight areas within the threshold travel time  $d_0 = 20$  min by walking, Guangzhou**

Note: Using the tool IDW (inverse distance decay) of ArcGIS: the decay parameter is "1" and the threshold travel time is 20 min by walking (around 1400 metres) in travel conditions of Guangzhou road system.

Source: own draft, 2017. Map database: GIS database of boundaries, routes of Guangzhou, Sun-Yat sen University, 2013. Population database: the Sixth census of Guangzhou, 2010. Location and supply of medical facilities: <https://map.baidu.com/>; <http://yyk.99.com.cn/guangzhou/> [access on June, 2017].

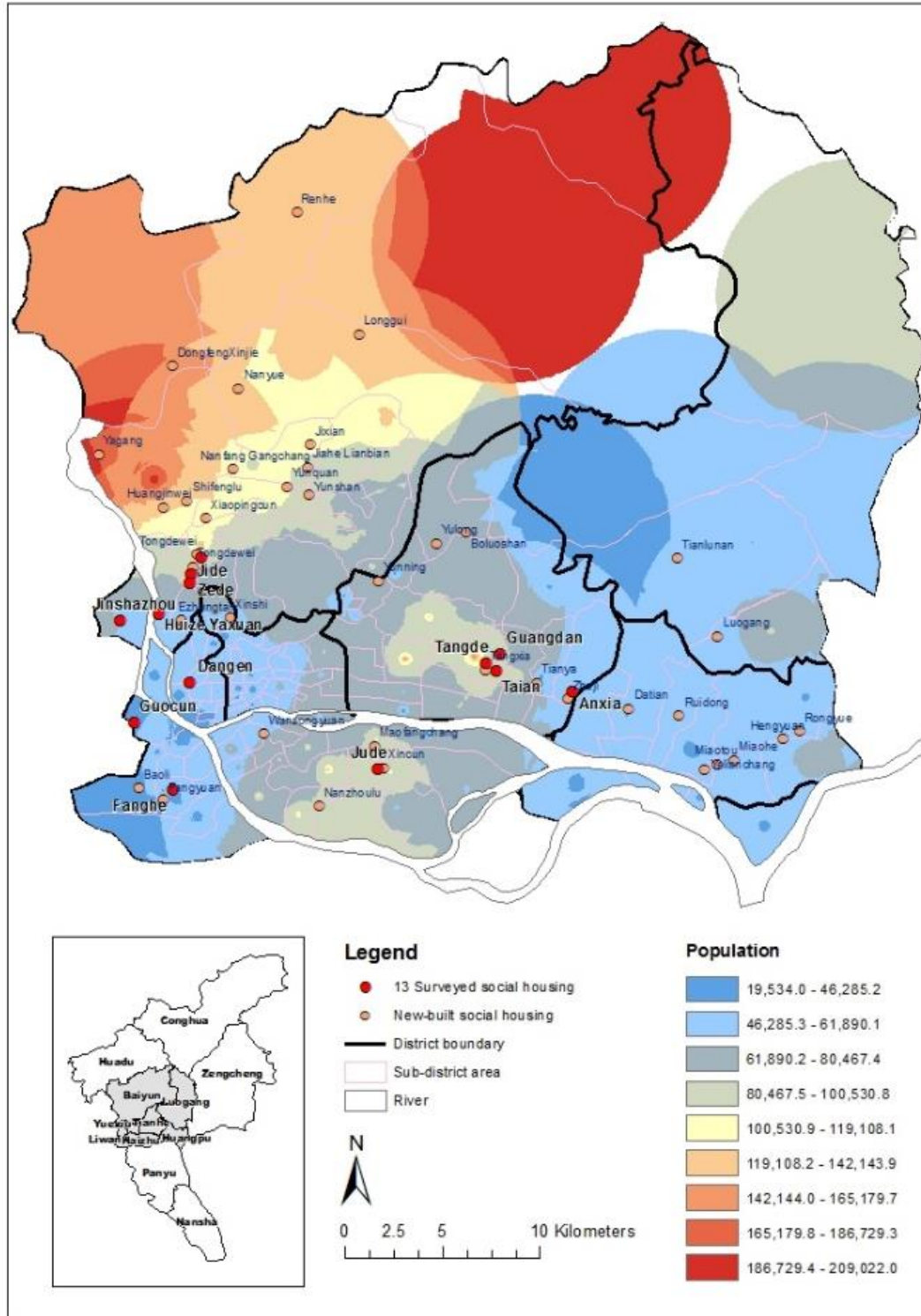




**Fig. 7.6 Accessible physicians at key healthcare facilities, by distance decay to weight areas within the threshold travel time  $d_0 = 20$  min by walking, Guangzhou**

Note: Using the tool IDW (inverse distance decay) of ArcGIS: the decay parameter is "1" and the threshold travel time is 20 min by walking (around 1400 metres) in travel conditions of Guangzhou road system.

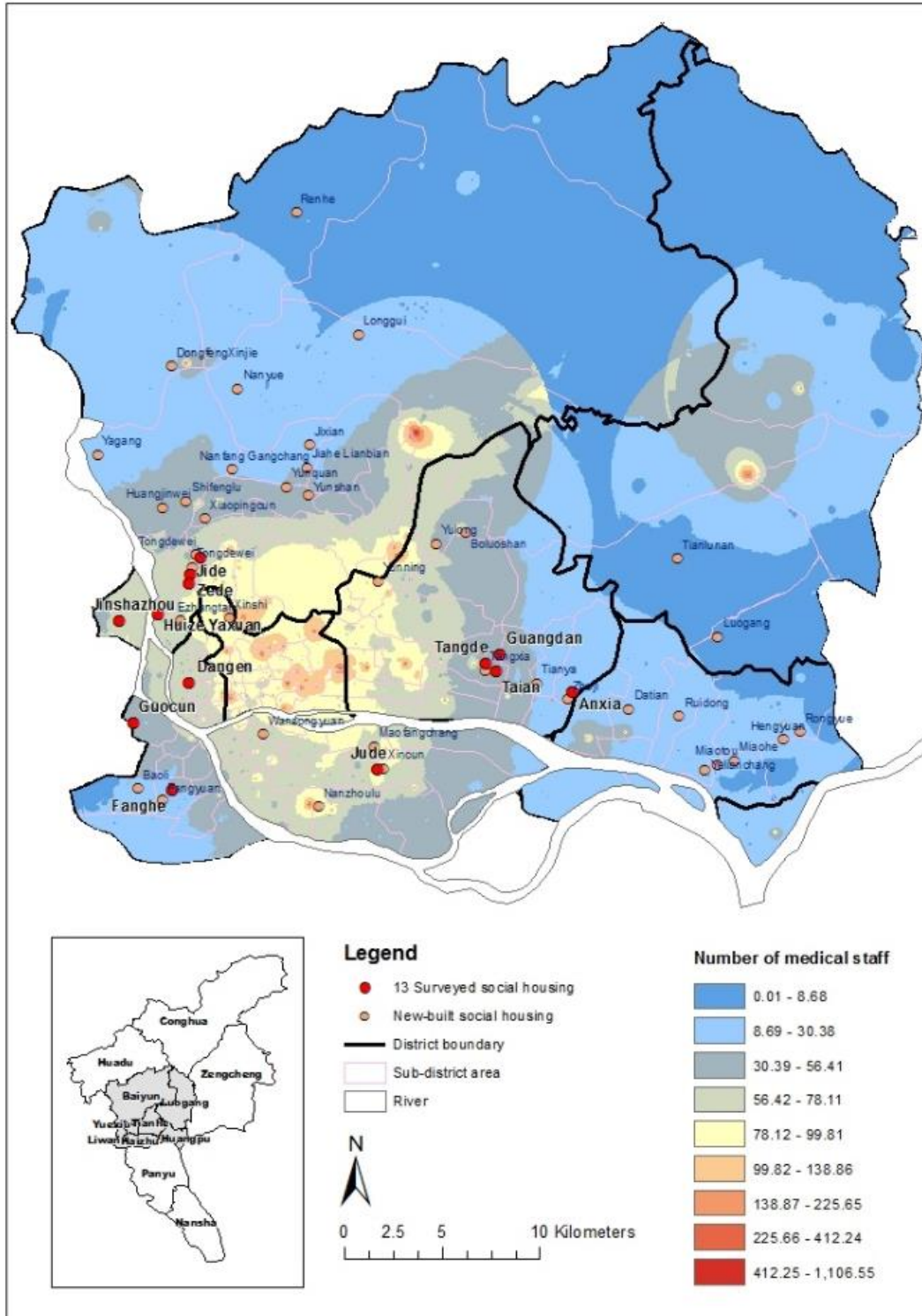
Source: own draft, 2017. Map database: GIS database of boundaries, routes of Guangzhou, Sun-Yat sen University, 2013. Population database: the Sixth census of Guangzhou, 2010. Location and supply of medical facilities: <https://map.baidu.com/>; <http://yyk.99.com.cn/guangzhou/> [access on June, 2017].



**Fig. 7.7 The distribution of population, by distance decay to weight areas within the threshold travel time  $d_0 = 20$  min by bus, Guangzhou**

Note: Using the tool "IDW" (inverse distance decay) of ArcGIS: the decay parameter is "1" and the threshold travel time is 20 min by bus (around 7000 metres) on travel conditions of Guangzhou road system.

Source: own draft, 2017. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes of Guangzhou. Population database: the Sixth census of Guangzhou, 2010. Location and supply of medical facilities: <https://map.baidu.com/>; <http://yyk.99.com.cn/guangzhou/> [access on June, 2017].



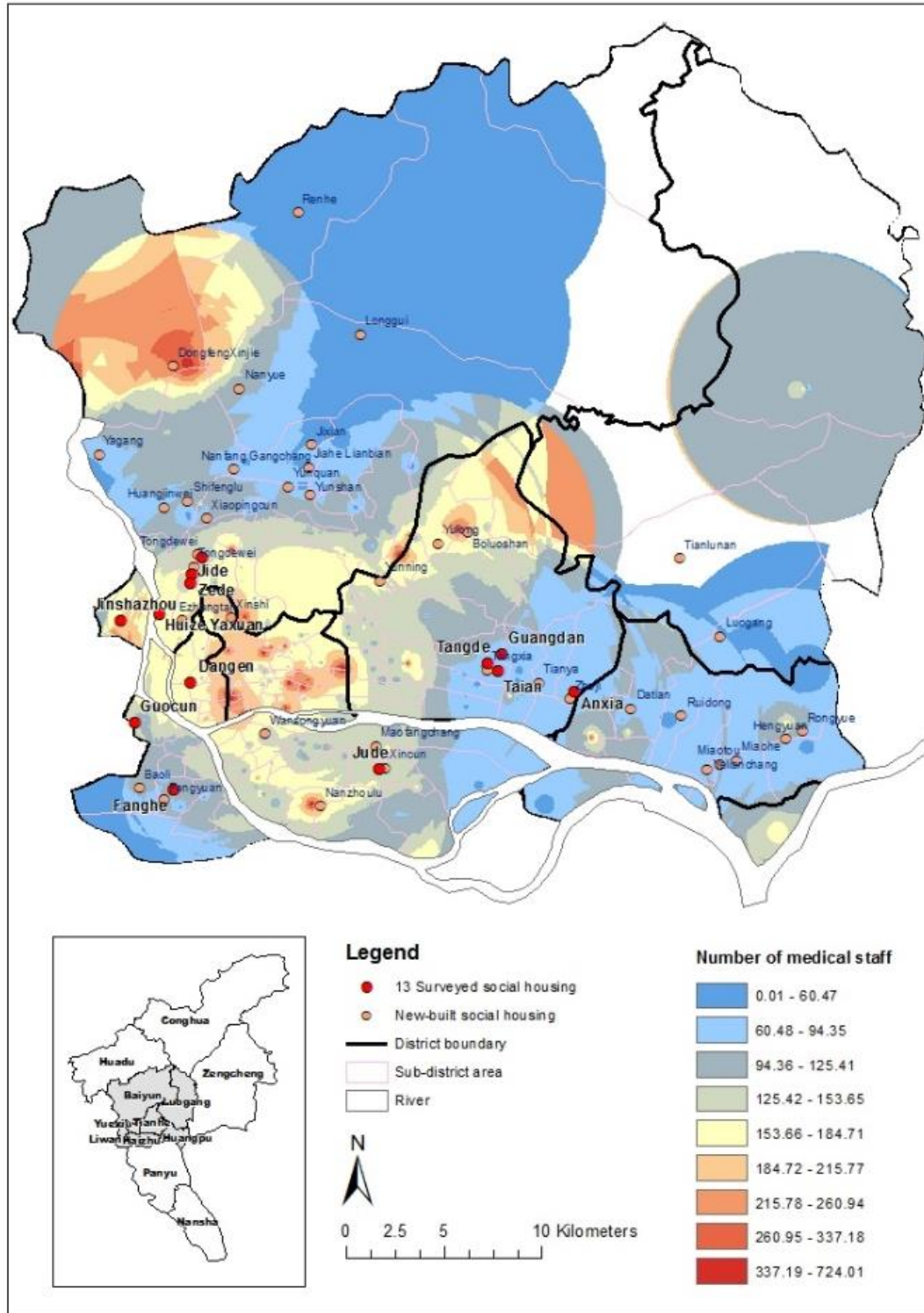
**Fig. 7.8 Accessible physicians at primary healthcare facilities, by distance decay to weight areas within the threshold travel time  $d_0 = 20$  min by bus, Guangzhou**

Note: Using the tool "IDW" (inverse distance decay) of ArcGIS: the decay parameter is "1" and the threshold travel time is 20 min by bus (around 7000 metres) on travel conditions of Guangzhou road system.

Source: own draft, 2017. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes of Guangzhou.

Population database: the Sixth census of Guangzhou, 2010. Location and supply of medical facilities: <https://map.baidu.com/>; <http://yyk.99.com.cn/guangzhou/> [access on June, 2017].





**Fig. 7.9 Accessible physicians at key healthcare facilities, by distance decay to weight areas within the threshold travel time  $d_0 = 20$  min by bus, Guangzhou**

Note: Using the tool "IDW" (inverse distance decay) of ArcGIS: the decay parameter is "1" and the threshold travel time is 20 min by bus (around 7000 metres) on travel conditions of Guangzhou road system.

Source: own draft, 2017. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes of Guangzhou.

Population database: the Sixth census of Guangzhou, 2010. Location and supply of medical facilities:

<https://map.baidu.com/>; <http://yyk.99.com.cn/guangzhou/> [access on June, 2017].

### 7.1.3 Approach of cost distance

The service area of a facility based on the road system is drawn using the method of cost distance. The 2SFCA provides a method to measure the accessibility score in reaching the available facilities; the travel distance between the service location and the demand location is calculated without taking the influence of traffic conditions into account. However, for the demand population, the travel time required to reach facilities relates to individual behaviour which is linked to the real traffic conditions. To simulate a more accurate service area within a certain travel time, the urban road system should be considered.

There are two ways to fulfil this aim in ArcGIS: least-cost distance analysis and network analysis. Least-cost distance is the cheapest distance from the start location to the end location. The method is based on a cost surface (not only the financial cost, but also the travel cost) when passing the location. The way that uses the least cost to connect two points is the least-cost path. The network distance is achieved by GIS analysis using vectoral data on the road system. Measuring network distance is more accurate when simulating the real travel situation. The road system not only connects locations by polylines, but also contains features like road barriers, stops, connections, velocity, traffic flows, direction and quality. Network analysis has advantages when determining complex conditions, like the influence of boundaries (Frank, Glanz & McCarron, 2006; Salze et al., 2011). Meanwhile, a very large dataset is required. To conclude on the pros and cons of these methods and our database, this study selects the method of cost distance on the basis of the road system to depict the service areas of different travel times.

Estimating a favourable least-cost path is based on an accurate cost surface. In our research, the road system acts as the dynamic of travel cost. Travelling along the road system generates less cost than the cost of crossing areas without paths. That is to say, a person can travel long distances along the road system at low cost within a fixed travel time, but incur high costs to travel a short distance when crossing areas without a road system. By defining the travel time (which means a top limit on cost), the function of cost distance can compute all accessible locations around the service location within this time and thus shape the service area. The concrete steps for carrying out the cost distance method are:

1) To establish a complete road network. The more detailed the road system is, more reliable the cost distance analysis will be. We have created polyline-feature layers of freeways, major roads, sub-arterial roads and paths (see Fig.7.10). Though the path layer provides an extremely detailed road system, it still doesn't show that all service locations are correctly connected to it. Therefore, we additionally create another polyline-feature layer to connect every service location to the path system with the shortest straight line. This step confirms that all service points are definitely on the traffic lines. And the connect-line layer is drafted with following steps:

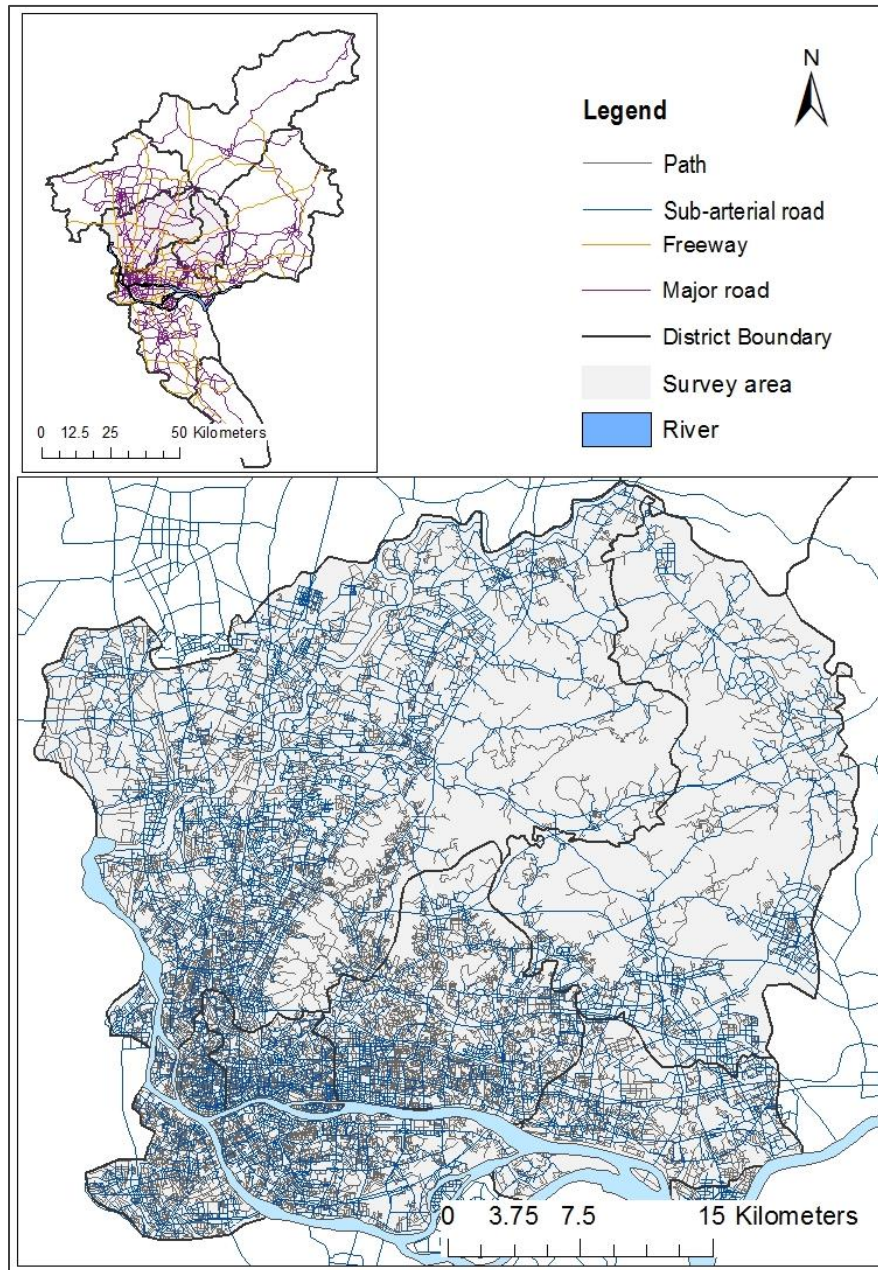
- Find the nearest service location on the road system by using the tool "Near" of ArcGIS; we thus achieve a new layer of nearest locations
- Append the layer of nearest points to the layer of service point using tools of "Make XY Event Layer" and "Append"
- Draw connecting lines using the tool "Point to Line"; thus we get the connect-line layer

2) To build up a cost surface. The cost surface is a raster layer, and every cell on this layer has a value. The value represents the required cost when passing this cell unit. Our study uses the road network as ground data for establishing the surface. After transforming polyline-feature layers of road systems to raster form, we revalue each cell using the "Reclassify" and "Weighted overlay" tools in ArcGIS. The new value of the road area is "1" and the blank area is "10", that is to say crossing a non-road cell demands 10 times the cost of passing a road cell.

3) To calculate cost distance. By inputting the cost surface and point-feature layers of facilities to the "Cost Distance" tool in ArcGIS, and setting a maximum travel distance based on travel time, we will obtained the service area of facilities for a certain travel time.

In our study, this method was selected to analyse the service area of facilities (i.e. medical facilities, middle schools, shopping malls, parks and metro stations). We tested six values for travel time (with an increment of 20 minutes) in line with the categories in the questionnaire: within 20 min by walking, 20–40 min by walking, 40–60 min by walking, 20 min by bus, 20–40 min by bus and 40–60 min by bus. In terms of the mean level of velocity when travelling in Guangzhou,

we set walking speed as 4.2 km/h and bus speed as 21 km/h. Consequently, we achieve six levels of service areas around each service location.



**Fig. 7.10 Road system of Guangzhou**

Source: Map database: Google map; Sun-Yat sen University, 2013, GIS database of Guangzhou.

## 7.2 Accessibility to less accessible facilities (LES)

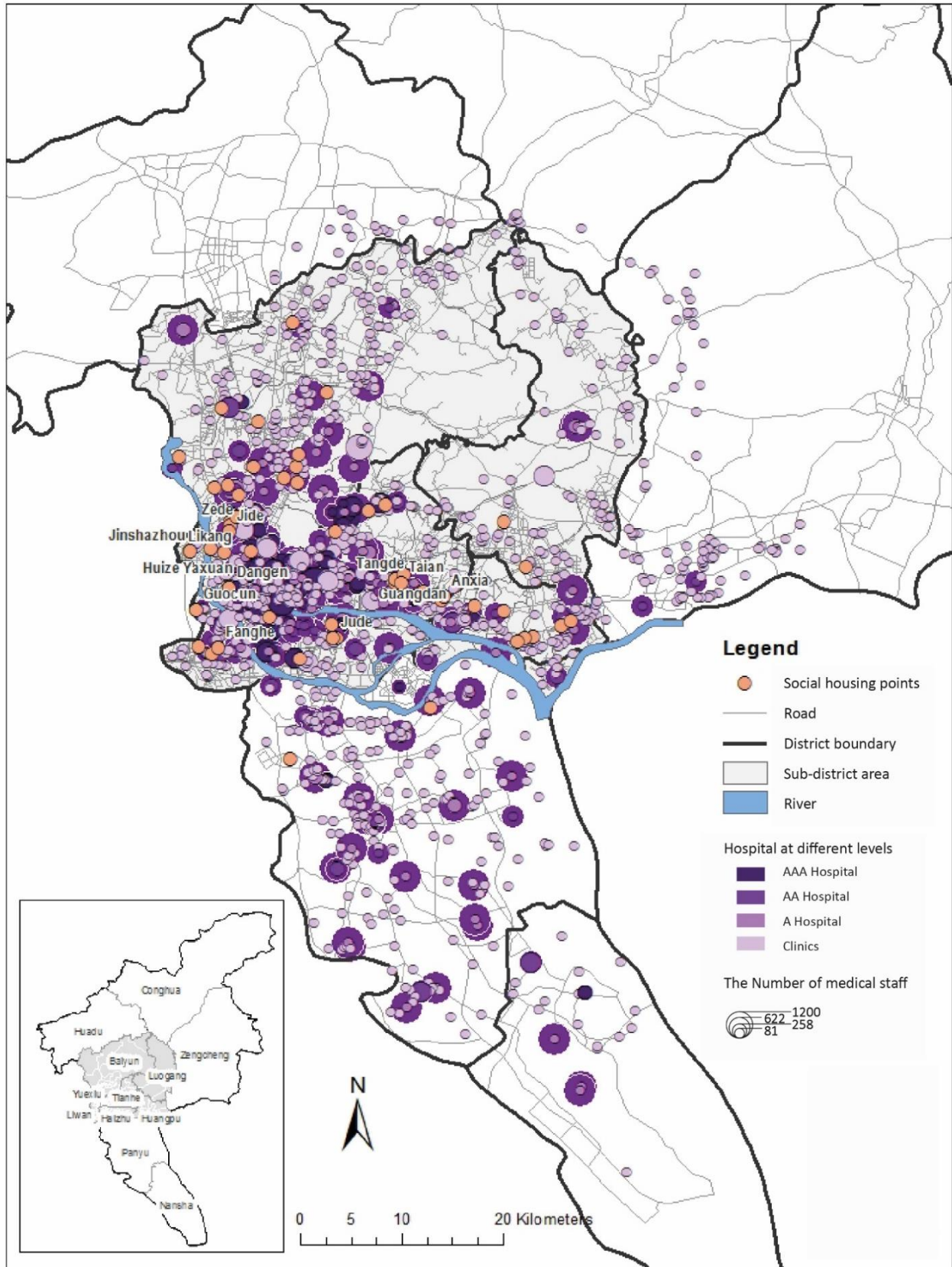
### 7.2.1 Accessibility to medical facilities

When examining the accessibility of medical facilities, two issues are involved: one is the distance to the facilities and required travel time to reach them; the second is the accessible number of healthcare services. The accessibility of a medical facility means more than the spatial distance, as it is also associated with the needs of the population and the supply of facilities. By exploring these two issues, the study attempts to provide an overall view.

Furthermore, our study classified the healthcare facilities into two groups: the key medical facilities and primary healthcare facilities (see Fig.7.11). In comparing the two types of medical facility, key hospitals offer higher-level medical services and comprehensive treatment. In our study, a key medical facility is an authorized hospital, which contains AAA-hospitals (*San Jia* hospitals), AA-hospitals (*Er Jia* hospitals) and A-hospitals (*Yi Jia* hospitals). An AAA hospital is a medical facility that is ranked at the highest level. To be ranked as such, it must have over 500 patient beds, high-level healthcare services as well as a research mission. AA-hospital is the second level and A-hospital is the third level. A primary medical facility refers to all kinds of healthcare facilities in the city of Guangzhou.

Generally speaking, key hospitals are mostly situated in the central areas with a high demand population, while primary healthcare services like clinics and sanitary stations demanded more often are located locally, close to communities or sub district. This location principle is influenced by economics, and has been widely explored by central place theory (CPT) (Christaller, 1933; Davies, 1967; Berry, Barnum & Tennant, 1962; Decay, 1965; Veneris, 1984; Preston, 1971; King, 1985; Berry & Garrison, 2005; Allen & Sanglier, 2010; Hsu, 2012; Guo & Liu, 2018). The city centre houses various businesses, so the number of services in it is more abundant, whereas primary or personal service zones offer only the most-needed basic goods and services (Knob & Brunner, 1971: 109). Davies (1967) assumed a hierarchical arrangement of service centres: higher-level services, such as universities, medical specialists, hospitals and high quality commercial, which are not provided in small zones (Berry& Garrison, 1958: 152). The size of the service area would be different and is in line with the level of the central settlement. A six-angle nest structure was developed to depict the service areas. In marketing principles ( $K$ -value = 3), this postulates that the market area of each pair of neighbouring central places is shared evenly by their upper-level central location. Consequently, the higher-order location possesses  $1/3$  of the market area of the consecutive lower-order location which is situated in its neighbour. In a six-angle nest, except its own market area, the higher-order location also dominates another pair of market areas of a lower-order location. The hierarchy of settlements is then arranged according to the rule of three. The number of places at the lower level is always triple the number of the consecutive upper-level locations: 1, 2, 6, 18, ... , and the dominated market area of the central location increases by 1, 3, 9, 27, ... . That is to say, key hospitals serve larger area which encompass several smaller-size primary service areas. Individuals travel to the nearest central location for goods and services and will go further to access higher-order services (Knob & Brunner, 1971: 30-31). In this sense, only a lengthy travel time to hospitals may hardly indicate that the population experiences difficulties in reaching healthcare services. An analysis of separate groups of medical facilities makes it possible to ascertain the difference between accessibility to primary healthcare and to key hospitals. This analysis may be helpful in identifying whether social housing residents really experience injustice or are merely influenced by locational economics in accessing medical facilities.





**Fig. 7.11 Distribution of all medical facilities in Guangzhou, 2017**

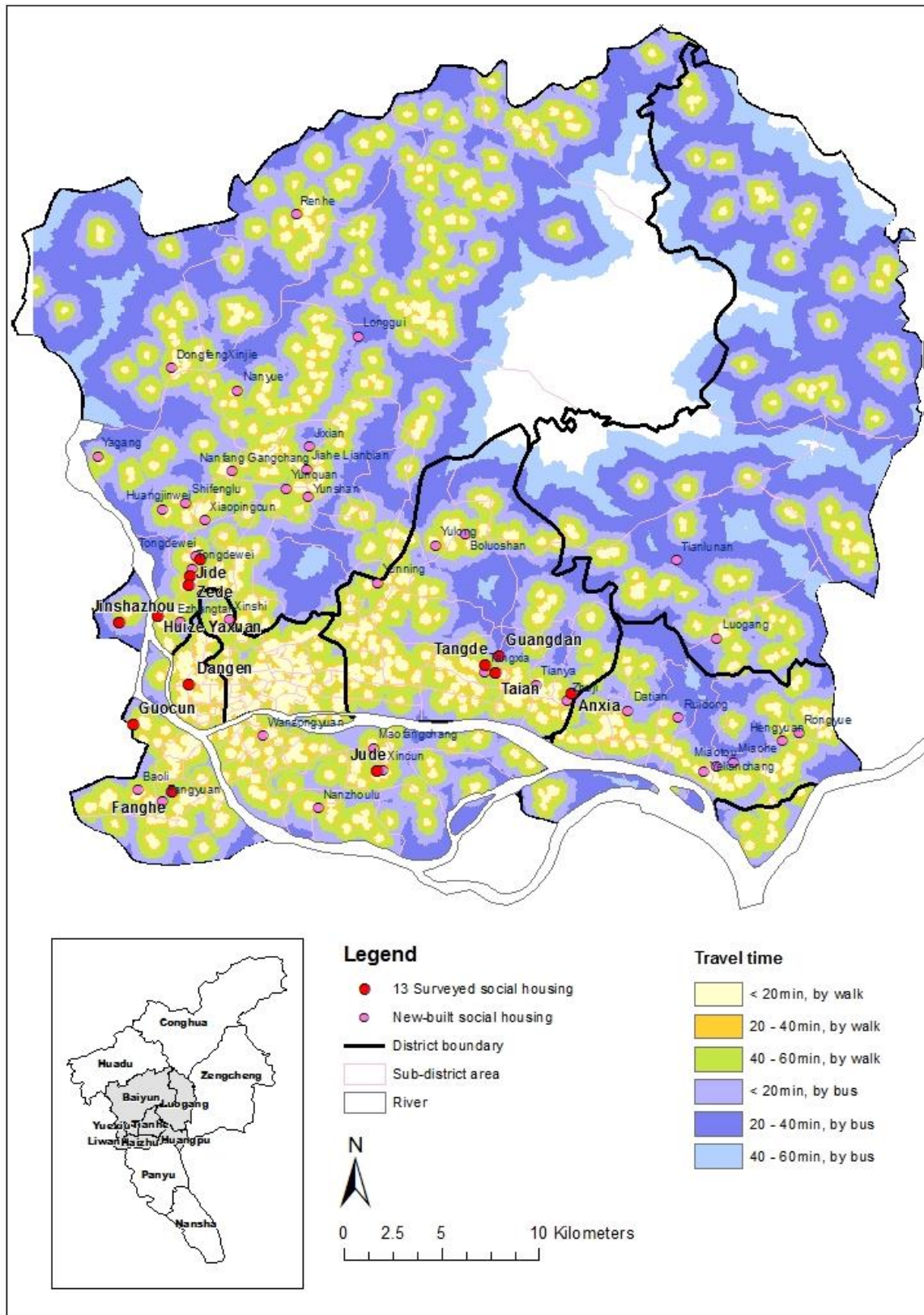
Source: own draft, 2017. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes of Guangzhou. Location and supply of medical facilities: <https://map.baidu.com/>; <http://yyk.99.com.cn/guangzhou/> [access on June, 2017].

### 7.2.1.1 Service area of medical facilities: ArcGIS-based analysis

By using the method cost distance of ArcGIS (see Chapter 7.1.3), we measured the service areas of primary healthcare services and key hospitals respectively (see Fig.7.12 & Fig.7.13). In this study, the service area of a facility refers to all surrounding locations that can be reached within a defined travel time under the road conditions of Guangzhou. Six rings are shown around the facilities; these represent the service areas for 20 min walking, 20–40 min walking, 40–60 min walking, 20 min by bus, 20–40 min by bus and 40–60 min by bus respectively.

Most social housing communities are located within a service area of 40 min walking distance from a primary healthcare facility (see Fig.7.12). This finding indicates that the majority of residents who live in social housing communities can reach primary physicians within 40 minutes on foot. Among social housing communities surveyed, those of Dang'en, Fanghe, Jude, Tongde, Tai'an, Zede and Huize Yaxuan lie within a service area of 20 min walking distance from a primary healthcare facility. Residents in these seven communities may enjoy the shortest distance to physicians. Another three communities, Guocun, Jide and Likang, are located on the circle of 20–40 min walking, when Anxia and Jinshazhou are situated on the ring of 40–60 min walking, Guangdan is situated on the even farther ring of 20 min by bus. These results imply that residents of these six social communities may not find it as easy as people in the first seven communities to access basic healthcare. Longer travel time or a faster vehicle may be required. The disparity in reaching primary physicians is particularly obvious in Guangdan, Anxia and Jinshazhou. Guangdan and Anxia are two projects that were developed after 2010 in Tianhe district, and Jinshazhou is located on the western margins of Baiyun district. The relative newness of the projects and the limits of the location of the social housing communities may result in some difficulties in reaching the nearest physicians. Additionally, another 38 communities which are under construction are mainly scattered in locations in even remoter areas, and lie within a service area of 20–40 min walking distance. At present, Longgui, Jixian in Baiyun district, Tianlunan in Luogang district and Miaohe in Huangpu district represent the farthest distance to basic healthcare services. They are located on the ring of 20 min by bus and the ring of 20–40 min by bus. Generally speaking, there are no significant differences in the travel time to visit physicians among social housing communities; people can reach basic healthcare within 40 min of walking or 20 min by bus. Nevertheless, if living in specific communities, such as Guangdan, Anxia and Jinshazhou, Longgui and Tianlunan, residents may find it difficult (takes longer and may need a faster vehicle) to reach basic healthcare.

Furthermore, most social housing communities are located in areas that have certain distance to key hospitals, and those that are near the central area or that have been developed for a long time show advantages in accessing key hospitals (see Fig.7.13). Six surveyed communities (Dang'en, Guocun, Jude, Tangde, Zede and Jide) are located on the 40–60 min walking service area of key hospitals. Fanghe, Tai'an and Guangdan lie on the service area of 20 min by bus; and Anxia, Huize Yaxuan and Likang are located on the ring of 20–40 min by bus; Jinshazhou is situated on the ring of 40–60 min by bus. As to uncompleted projects, they are mainly located on the 20 min by bus service area. Obviously, longer travel time or a faster vehicle is more likely to be required in reaching key hospitals than reaching primary healthcare. This may indicate that residents in social housing communities should take the bus to reach the key hospitals. Apart from the residents of some centrally located communities, most of people in social housing take over 40 minutes by bus to reach key hospitals.

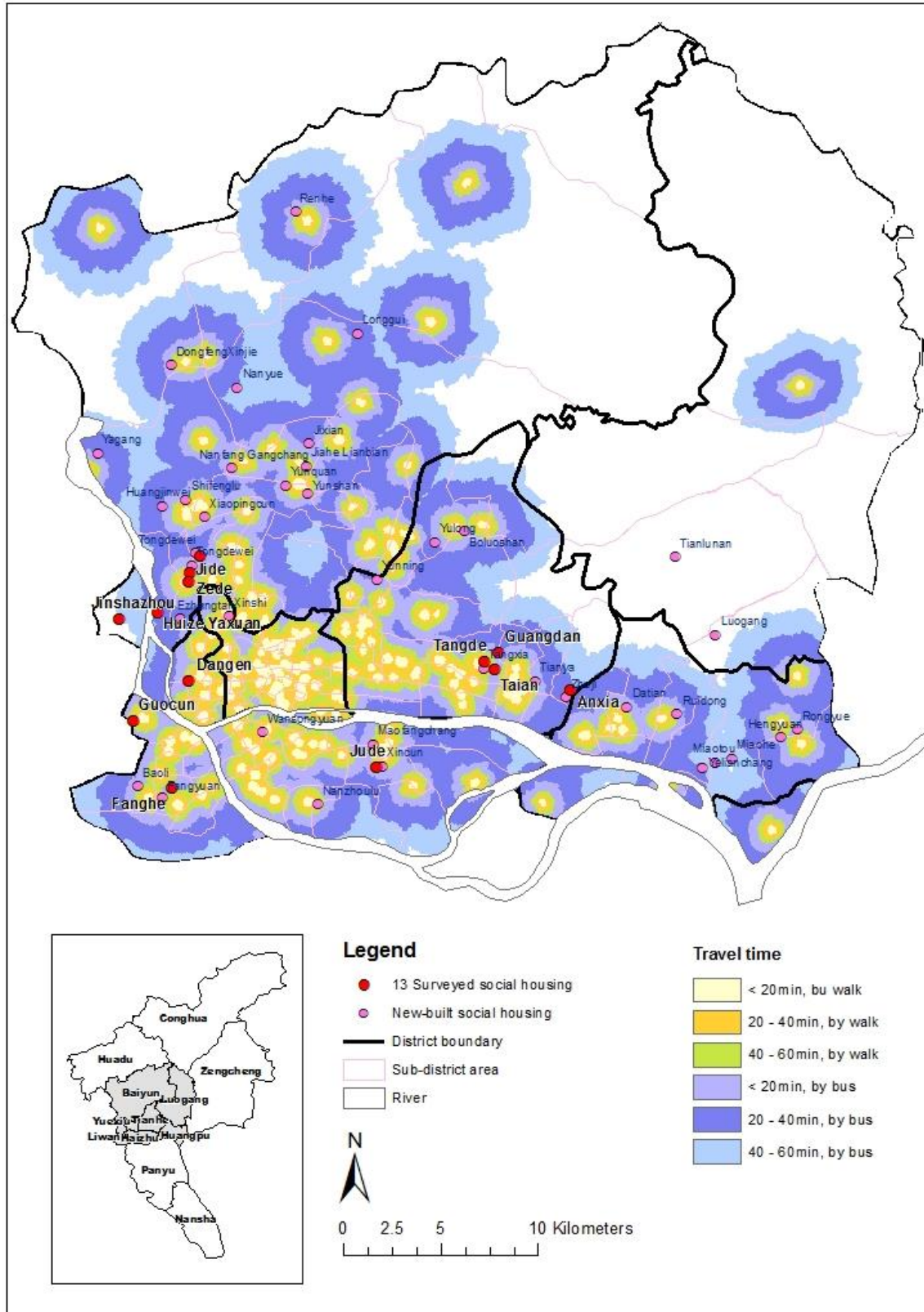


**Fig. 7.12 Service areas of primary medical facilities, by travel time and travel mode, Guangzhou**

Note: Analysed with "cost distance" in ArcGIS, see details in 7.1.3.

Source: own draft, 2017. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes of Guangzhou. Location and supply of medical facilities: <https://map.baidu.com/>; <http://yyk.99.com.cn/guangzhou/> [access on June, 2017].





**Fig. 7.13 Service areas of key medical facilities, by travel time and travel mode, Guangzhou**

Note: Analysed with “cost distance” in ArcGIS, see details in 7.1.3.

Source: own draft, 2017. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes of Guangzhou. Location and supply of medical facilities: <https://map.baidu.com/>; <http://yyk.99.com.cn/guangzhou/> [access on June, 2017].

### 7.2.1.2 Travel convenience to medical facilities: survey-based analysis

The responses of the 660 surveyed residents about the required travel time and selected travel mode to medical facilities were presented by means of percentages by location, time of construction, scale and dwelling mode (see Tab.7.2). We can see that the location of the community and the time of construction have strong links with the travel time and travel mode of respondents when accessing medical facilities.

**Tab. 7.2 Percentages of surveyed residents by travel time and by travel mode to access medical facilities, by location, time of construction, scale and dwelling mode**

Categories		Accessibility	Travel time			Travel mode				
		<20min	20-40 min	>40 min	by foot	by bicycle	by mopeds	by bus or metro	by car	
Location	Liwan	78.4%	12.2%	9.4%	78.4%	0.7%	0.0%	18.7%	2.2%	
	Haizhu	80.0%	19.0%	1.0%	78.0%	0.0%	0.0%	22.0%	0.0%	
	Tianhe	47.2%	37.7%	15.1%	49.1%	7.5%	0.6%	37.7%	5.0%	
	Baiyun	54.1%	17.3%	28.6%	56.1%	4.3%	3.1%	29.8%	6.7%	
Time of construction	From 1998	64.3%	23.2%	12.4%	62.7%	1.9%	0.6%	32.5%	2.2%	
	2008-2010	64.9%	15.4%	19.7%	64.5%	5.0%	1.8%	21.9%	6.8%	
	After 2010	31.7%	40.0%	28.3%	51.7%	6.7%	3.3%	35.0%	3.3%	
Scale a	Big scale	57.6%	17.2%	25.2%	64.3%	2.2%	1.6%	27.1%	4.8%	
	Medium scale	63.3%	30.4%	6.3%	65.4%	3.3%	0.4%	29.2%	1.7%	
	Small scale	69.7%	13.1%	17.2%	49.5%	9.1%	3.0%	29.3%	9.1%	
Dwelling mode b	Fully mixed	64.3%	23.2%	12.5%	62.7%	1.9%	0.6%	32.5%	2.2%	
	Semi-mixed	60.1%	18.2%	21.7%	64.0%	3.9%	1.6%	25.2%	5.4%	
	Single	55.6%	24.7%	19.8%	56.8%	9.9%	3.7%	21.0%	8.6%	

Note: <sup>a</sup> Categories of scale are natural break which is based on population of social housing communities, big scale refers to community have over 4000 residents; population of medium scale one is during range 1500-4000; small scale one have <1500 population. <sup>b</sup> Fully mixed refers to three different type households (early social housing: ANJU housing, low-rent housing and affordable housing) are mixed in community. Half mixed refers to two kinds of social housings (low-rent housing and affordable housing) are spatially integrated in same community but locate in different buildings and normally separated by paths. Single community means small social housing community built after 2008, and this kind of community has only affordable housing.

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B1 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

A much higher percentage of surveyed residents in communities near the central area (Liwan: 78.4%, Haizhu: 80.0%) can reach a medical facility within 20 minutes; this percentage drops to 47.2% in Tianhe district and 54.1% in Baiyun district. In addition, the proportion of respondents who travelled on foot to medical facilities reaches 78.4% and 78.0% in Liwan and Haizhu respectively, whereas the rate is obviously lower among respondents in Tianhe (49.1%) and Baiyun (56.1%). The survey data shows a notable gap between categories near the city centre (Liwan and Haizhu) and categories in the peripheral areas (Tianhe and Baiyun). A higher percentage of respondents in the communities of Liwan and Haizhu takes less than 20 minutes walking to reach a medical facility, which may indicate that residents of communities near the city centre have advantages in accessing medical facilities in a shorter time and by an easier travel mode.

Further, there is a notable disparity in the percentage of respondents between communities built before 2010 and those built after 2010. A higher rate of respondents of communities built before 2010 (from 1998: 64.3%, and in 2008–2010: 64.9%) can reach a facility within 20 minutes, while only 31.7% of respondents from communities built after 2010 can do so. At the same time, while 62.7% and 64.5% respondents of communities built before 2010 travelled on foot, the percentage is a bit lower (51.7%) among surveyed people in communities built after 2010. To conclude, over 60% of surveyed residents in earlier-built communities could access medical facility within a shorter travel time and by an easier travel mode, a much smaller percent of respondents in new communities (built after 2010) has similar access. The survey results indicate that residents in older communities may experience greater convenience when travelling to

medical facilities, whereas residents of newly developed communities have some disadvantages in accessing medical facilities.

In sum up, most social housing communities are located within a 40 min-walking service area of basic healthcare facilities. In addition, residents of communities near the city centre have advantages in terms of reaching basic medical facilities within a short travel time and using an easy travel mode, In comparison residents of newly built communities may experience some disadvantages (such as taking longer travel time and using faster vehicles) with regard to access. In addition, most communities are located within a service area of 40-60 min-walking or 20-40 min-bus of key hospitals. That is to say, in comparing access to basic healthcare, residents of social housing communities generally take longer travel time (40-60 min) or use faster vehicles (e.g. bus or metro) to reach key hospitals. The survey data indicates this situation is particularly significant among residents of communities built after 2010 and communities situated on the edge, and in remote areas, of the city, as they have obvious disadvantages when travelling to key hospitals.

### 7.2.1.3 Accessibility of available physicians at medical facilities

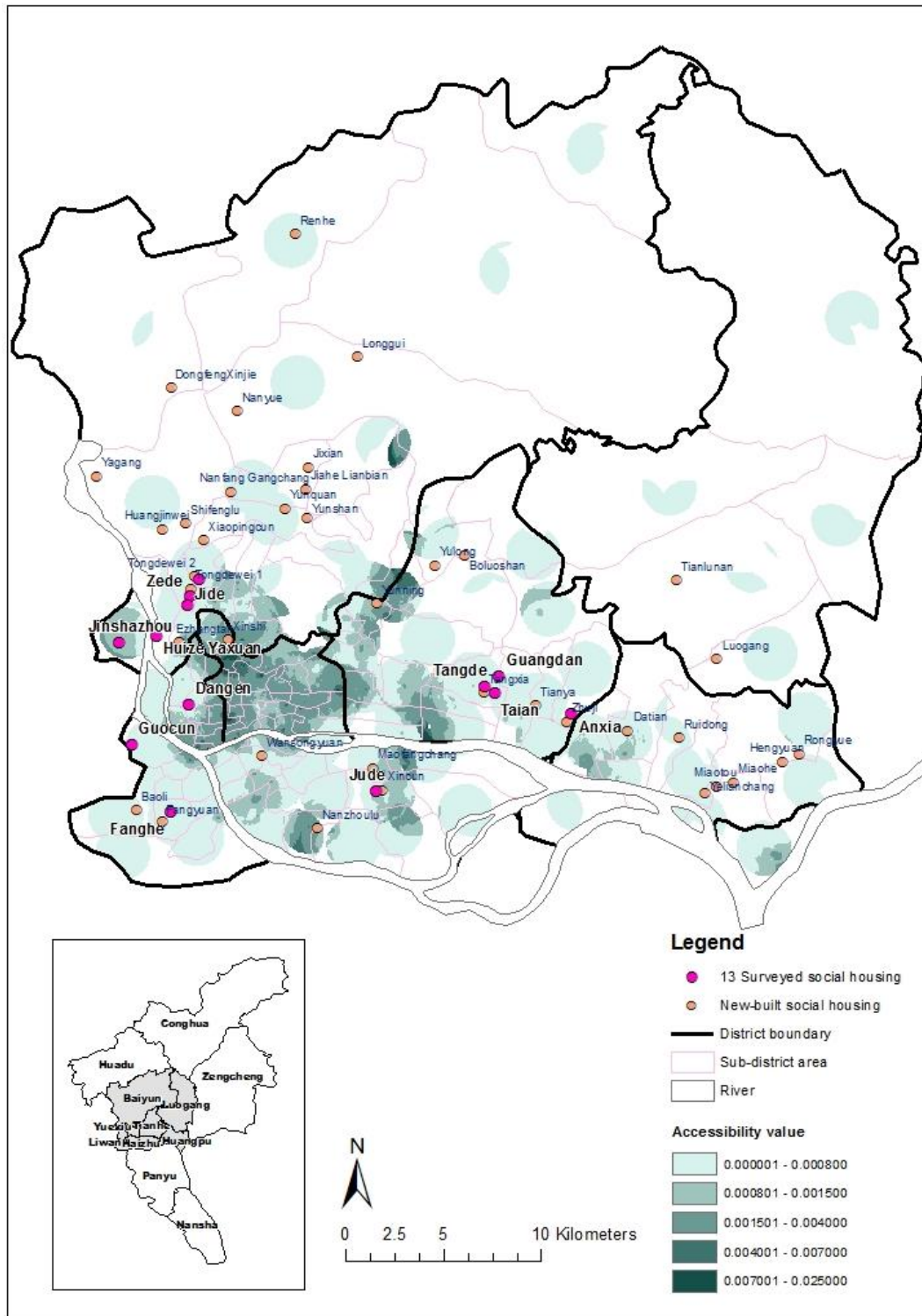
The purpose of the analysis in this section is to explore the available physicians and medical resources for the population within a certain travel time. The accessibility of medical facilities is not only an issue of travel time or spatial distance, but also the relationship between the supply of facilities and the demands of the population. We adapted the gravity-based 2SFCA (the distance decay parameter is “1”) method to calculate the accessibility score of every geographic unit in the city of Guangzhou (see details in 7.1.1). The score is a ratio of the supply of medical facilities to the demand population. We define the supply of medical facilities as the numbers of medical staff. A higher accessibility score indicates that the population of that place can reach more physicians within a threshold travel time and vice versa. By using the tool of “IDW” (inverse distance decay) in ArcGIS, we assigned the weights of the population centroids (the centroid of each sub district) to the surrounding locations within the threshold travel time (20 min by walking, and 20 min by bus) (see Fig.7.4 & Fig.7.7). In same way, the supplied physicians at primary medical facilities (see Fig.7.5 & Fig.7.8) and the physicians at key medical facilities (see Fig.7.6 & Fig.7.9) are distributed to nearby places within the threshold travel time. Then, we compute the ratio of the gravity-based available physicians to the gravity-based demand population to obtain the accessibility score (see Equation 9 and Equation 10 in Chapter 7.1.2) of all demand locations within the threshold travel time. The accessibility values of primary medical facilities are shown in Fig.7.14 and Fig.7.15, and the accessibility values of key medical facilities are visualized in Fig.7.16 and Fig.7.17.

**Accessibility to available physicians of basic healthcare.** Within a travel time of 20 minutes, the number of physicians available for basic healthcare for the population at the location of social housing communities is less than for people located in central areas. The gap is particularly significant when the population walk to the basic medical facilities, and the gap narrows to some extent when they use a faster vehicle such as a bus. As shown in Fig.7.14 & Fig.7.15, primary medical facilities with the highest accessibility scores are concentrated in the central city area (which includes Yuexiu district, north-eastern Liwan district, north-western Haizhu district, and the western edge of Tianhe district). The accessible value show a decrease along the centre-periphery line. This means that the population of the central area can reach more basic physicians within 20 min, by either walking or travelling by bus. In addition, by comparing the decay of the accessibility value along the distance, the reducing rate in Fig.7.14 (with the threshold travel time: 20 min-walking) is much sharper when the decrease represents a slower level in Fig.7.15 (with the threshold travel time: 20 min-bus). The results reveal that the advantage of the city central area in terms of the available number of basic physicians is more notable when the population accesses the basic physicians on foot.

Within 20 min-walking, nine of the 13 surveyed communities (except Jude and Jinshazhou, Huize Yaxuan and Anxia) are located in places with the lowest level of accessibility values, ranging from [0.000001, 0.0008] (see Fig.7.14). We also summarized the accessibility value of all social housing communities to medical facilities in Tab.7.3. The values of Jude and Jinshazhou remain at the second level and are slightly higher: 0.001031 and 0.001101 respectively. And the accessibility values of Huize Yaxuan and Anxia are zero. Moreover, 38 new developed projects show an even worse situation, especially those that lie in the very distant regions of Baiyun, Luogang and Huangpu. Populations in these places even cannot walk to basic physicians within 20 min. This outcome indicates that the population of eleven surveyed social housing communities (except Huize Yaxuan and Anxia) can reach basic medical facility within 20 minutes on foot, but most of them can only access a very limited number of physicians in this way. As the uncompleted communities are in very remote locations, no basic physicians can be accessed by 20 min-walking.

When defining the threshold travel time as 20 min-bus, the accessibility values of social housing communities to basic healthcare increase to some extent (see Tab.7.3). The accessibility scores of seven surveyed communities range at the second level between [0.000801–0.001500], while value of the other six communities (four in Tianhe district: Tangde, Guangdan, Tai'an and Anxia; Fanghe of Liwan district; Likang of Baiyun district) remain at the lowest level [0.000001–0.000800] (see Fig.7.15). Another 38 projects (apart from a few communities near the city centre) are mainly located in places with the lowest accessibility scores. These results indicate that the population of the surveyed social housing communities (except those in Tianhe district) can reach more physicians with 20 min-bus travel. Although the number of physicians available to them is still less than those to people in the city centre, the disparity is not as large as the one with the 20 min-walking threshold. However, all communities in Tianhe district and the new social housing communities with even remoter locations experience significant disadvantages in reaching sufficient physicians.

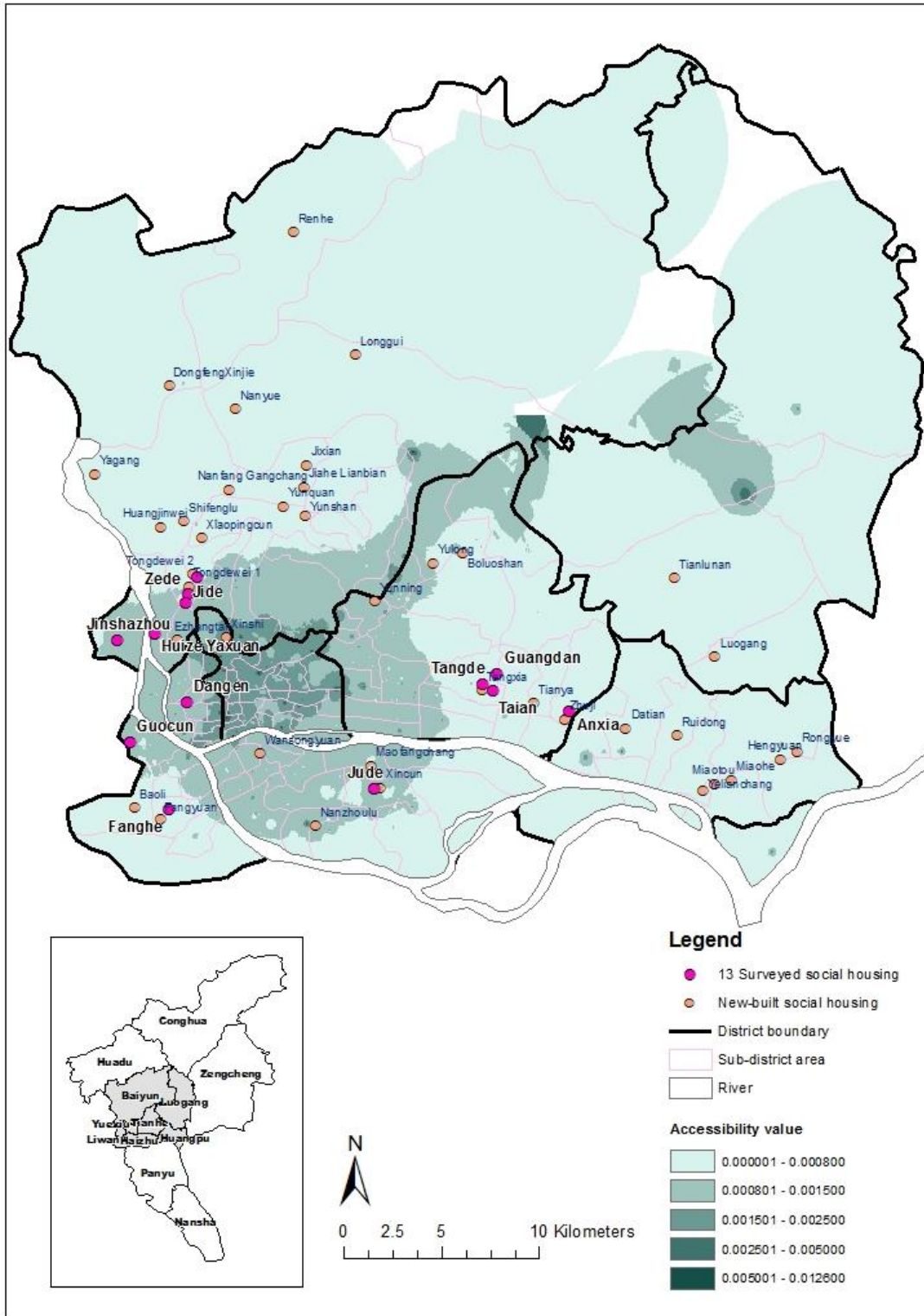
To sum up, most residents of the social housing communities that are already in use can access basic healthcare within 20 min walking, but the number of basic healthcare available may be small. When they go by bus, a few more physicians can be reached within 20 minutes. However, compared with the physicians available to the population in the central city areas, the areas surrounding (which can be reached within 20 min walking) social housing communities (particularly communities in Tianhe district and in very remote regions) provide residents with far fewer available physicians.



**Fig. 7.14 Accessibility scores of primary medical facilities: the gravity-based ratio of available physicians at primary medical facilities to demand population within the threshold travel time  $d_0 = 20$  min walking, Guangzhou**

Note: Using the tool "IDW" (inverse distance decay): the distance decay parameter is "1" and the threshold travel time is "20 min walking" (about 1400 m) under the travel condition on the Guangzhou road system. Source: own draft, 2017. Population data source: Sixth census of Guangzhou, 2010. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes of Guangzhou. Location and supply of medical facilities: <https://map.baidu.com/>; <http://yyk.99.com.cn/guangzhou/> [access on June, 2017].





**Fig. 7.15 Accessibility score to primary medical facilities: the gravity-based ratio of available physicians at primary medical facilities to demand population within the threshold travel time  $d_0 = 20$  min bus, Guangzhou**

Note: Using the tool “IDW” (inverse distance decay): the distance decay parameter is “1” and the threshold travel time is “20 min bus” (about 7000 m) under travel conditions on the Guangzhou road system. Source: own draft, 2017. Population data source: Sixth census of Guangzhou, 2010. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes of Guangzhou. Location and supply of medical facilities: <https://map.baidu.com/>; <http://yyk.99.com.cn/guangzhou/> [access on June, 2017].

Tab. 7.3 Accessibility scores of locations of social housing communities to primary medical facilities and key hospitals: the gravity-based ratio of available physicians to demand population, by threshold travel time, Guangzhou

	District	Community	Threshold travel time: 20min walking		Threshold travel time: 20min bus	
			To basic medical facilities	To key medical facilities	To basic medical facilities	To key medical facilities
13 Surveyed communities	Western cluster – Liwan	Fanghe	0.000198	0.000616	0.000640	0.002207
		Guocun	0.000282	0.000874	0.000940	0.002944
		Dang'en	0.000548	0.002308	0.001299	0.003514
	Middle cluster- Haizhu	Jude	<b>0.001031</b>	0.001169	0.001022	0.001629
		Tangde	0.000230	0.000101	0.000454	0.000723
	Eastern cluster – Tianhe	Guangdan	0.000255	0.000099	0.000473	0.000912
		Tai'an	0.000430	0.000511	0.000487	0.000854
		Anxia	0.000000	0.000000	0.000413	0.001348
	Northern cluster – Baiyun	Zede	0.000250	0.000238	0.000803	0.001870
		Jinshazhou	<b>0.001101</b>	0.000000	0.001259	0.003475
		Jide	0.000214	0.000205	0.000885	0.001520
		Huize Yaxuan	0.000000	0.000000	0.001103	0.002914
		Likang	0.000250	0.000000	0.000648	0.001612
38 Uncompleted projects built after 2015	Liwan	Fangyuan	0.000246	0.000673	0.000601	0.002038
		Baoli	0.000139	0.000629	0.000492	0.002502
	Haizhu	Wansongyuan	0.000419	0.000450	0.001001	0.001258
		Xincun	0.000678	0.001175	0.001177	0.001537
		Maofangchang	0.000660	0.001223	0.000870	0.001604
	Tianhe	Nanzhoulu	0.001995	0.004641	0.001030	0.002372
		Tangxia	0.000230	0.000090	0.000488	0.000757
		Tianya	0.000415	0.001106	0.000472	0.001327
		Yunning	0.001358	0.001775	0.001208	0.002325
		Yulong	0.000000	0.000000	0.000745	0.002149
		Zhuji	0.000000	0.000000	0.000420	0.001374
		Boluoshan	0.000000	0.000000	0.000761	0.002798
	Baiyun	Tongdewei I	0.000080	0.000216	0.000814	0.001866
		Tongdewei II	0.000041	0.000000	0.000520	0.001489
		Ezhangtan	0.001183	0.000000	0.001340	0.003202
		Renhe	0.000034	0.000188	0.000035	0.000182
		Xiaopingcun	0.000370	0.000474	0.000514	0.001001
		Xinshi	0.003437	0.005249	0.000775	0.003538
		Huangjinwei	0.000069	0.000043	0.000334	0.000827
		Nanfang Gangchang	0.000037	0.000228	0.000213	0.000767
		Yunquan	0.000123	0.000222	0.000347	0.000738
		Yunshan	0.000000	0.000000	0.000535	0.000903
		DongfengXinjie	0.000000	0.000000	0.000110	0.001949
		Shifenglu	0.000000	0.000000	0.000410	0.000826
		Yagang	0.000000	0.000000	0.000116	0.000428
	Huangpu	Jiahe Lianbian	0.000000	0.000000	0.000328	0.000718
		Longgui	0.000000	0.000000	0.000110	0.000168
		Nanyue	0.000000	0.000000	0.000119	0.000832
		Jixian	0.000000	0.000000	0.000253	0.000616
		Datian	0.000787	0.002061	0.000459	0.001885
Ruidong		0.000063	0.000085	0.000289	0.001400	
Miaotou		0.000134	0.000000	0.000235	0.001921	
Yelianchang		0.000137	0.000000	0.000229	0.001894	
Miaohu		0.000000	0.000000	0.000198	0.001589	
Hengyuan		0.000000	0.000000	0.000264	0.001821	
Rongyue	0.000000	0.000000	0.000206	0.001550		
Luogang	Luogang	0.000000	0.000000	0.000094	0.001476	
	Tianlunan	0.000000	0.000000	0.000110	0.000000	

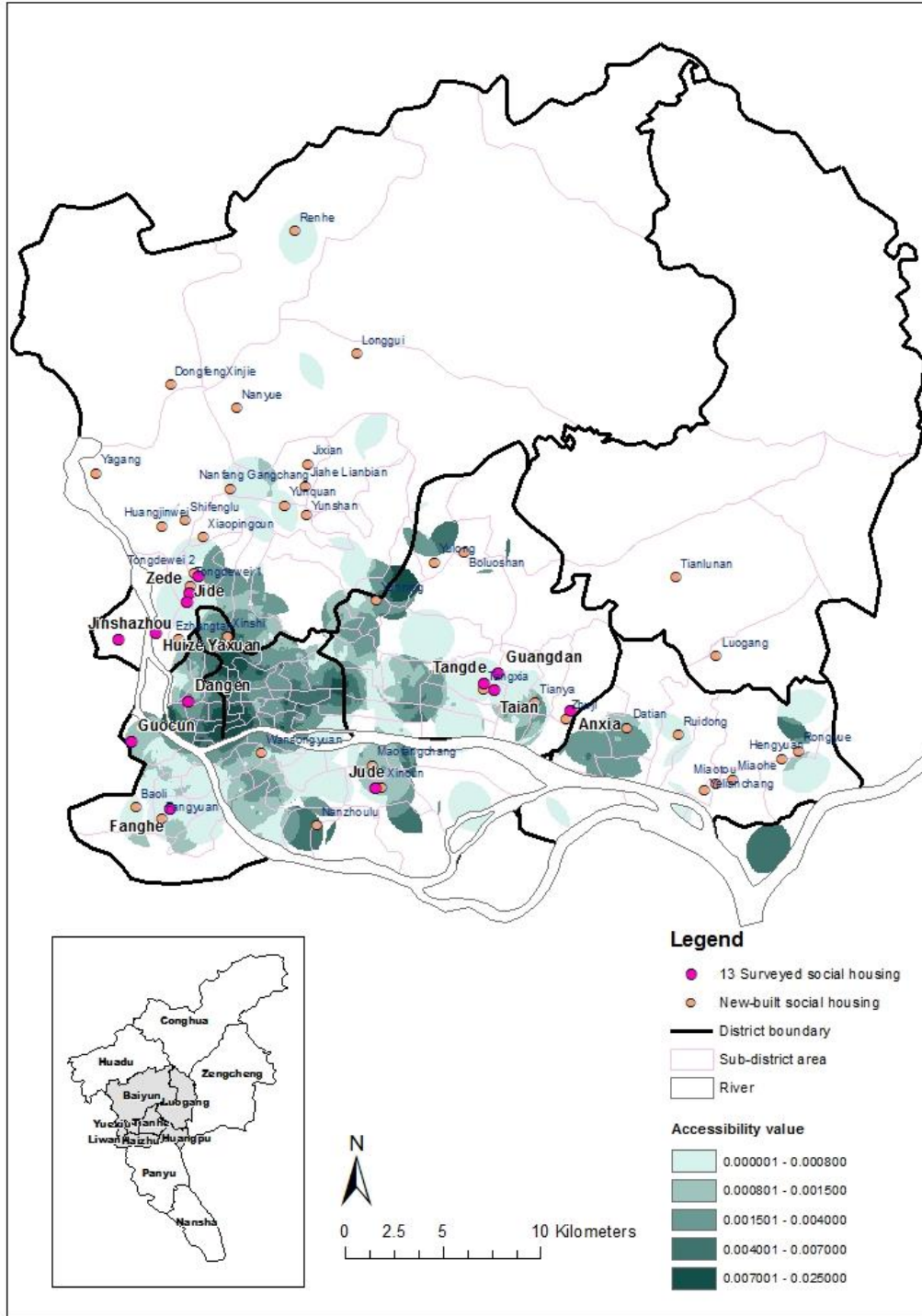
Note: The data is extracted from Fig.7.14- Fig.7.17. Using the tool of "IDW" (inverse distance decay). Source: own draft, 2017.



**Accessibility of available physicians at key medical facilities.** Within the travel time of 20 minutes on foot, the accessibility scores to key hospitals of people in social housing locations are very low and even zero in remote communities such as Anxia (in Tianhe district), Jinshazhou, Huize Yaxuan and Likang (in Baiyun district) (see Fig.7.16). When the threshold is 20 min-walking, the accessibility score displays a higher concentration in central city areas, which is represented by the connecting area of northeast Liwan district, Yuexiu and the northwest edge of Haizhu district and the western edge of Tianhe district (see Fig.7.16). Most social housing communities are located away from these areas, and their accessibility scores fall into the lowest range of [0.000001–0.000800]. In addition, many of 38 uncompleted projects show even lower scores on accessibility to available physicians. The disparity between the 13 surveyed social housing communities in terms of accessing available key hospital physicians is therefore quite clear. Communities near the city centre have much higher values than others, for example the accessibility score for Dang'en in Liwan district is 0.002308 and Jude in middle Haizhu district is 0.001169 (see Tab.7.3). Meanwhile, another seven surveyed communities have very low scores ranging from [0.000001–0.000800]. A null value at the locations of Anxia, Jinshazhou, Huize Yaxuan and Likang implies residents of these communities cannot reach any key hospital physicians within 20 min walking distance. To conclude, the majority of residents of social housing communities (except the ones near the city centre) can reach very few key hospital physicians when walking for 20 minutes. This disadvantage may be more notable in communities under construction in remote locations.

When we define the threshold travel time as 20 min-bus, the accessibility score of the locations of social housing communities show an average level in the whole city of Guangzhou (see Fig.7.17). The reduced gap in regard to the value of the city centre area implies that the quantity of available physicians at key hospitals will be greatly improved if these residents travel by bus. The accessibility values of nine surveyed communities (in the districts of Liwan, Haizhu and Baiyun) are located within the medium range [0.001501–0.002500] or second upper range [0.002501–0.005000]. However, the scores of four communities of Tianhe district (Tangde, Guangdan, Tai'an and Anxia) fall into the second-lowest level ranging in [0.000801–0.001500] (see Fig.7.17). Nevertheless, very remotely located communities in middle and north Baiyun district display very low scores. The population in these locations (social housing communities in Tianhe district and remote locations in Baiyun district) can access very few key hospital physicians even by 20 min-bus, they may have significant disadvantages in accessing sufficient key hospital physicians.

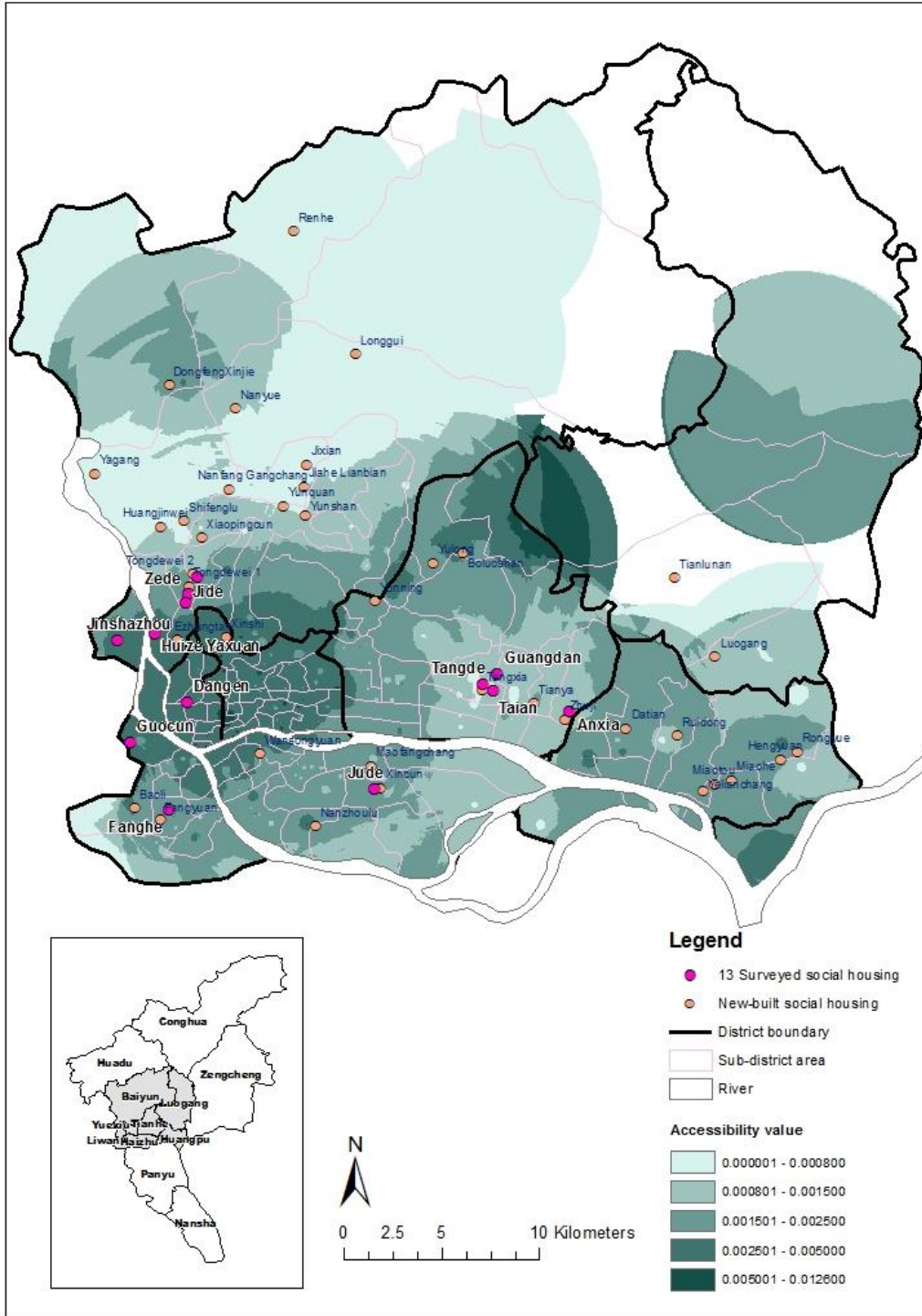
To conclude, the above results may indicate that very few or even no physicians at key hospitals are available for most social housing residents (except those who live in communities near the city centre) when they go on foot for 20 minutes. But travelling by bus may make it possible for residents of most social housing communities (except those in Tianhe and remote Baiyun district) to reach far more key hospital physicians in 20 minutes, and the accessibility level of key hospital physicians remains at an average level in the city Guangzhou. Nevertheless, residents in the surveyed communities of Tianhe (Tangde, Guangdan, Tai'an and Anxia) may experience disadvantages in reaching available physicians at key medical facilities, and those in communities under construction in remote regions of Baiyun may be confronted by this disadvantage in the future.



**Fig. 7.16 Accessibility score of key medical facilities: the gravity-based ratio of available physicians in key hospitals to demanded population within the threshold travel time  $d_0 = 20$  min walking, Guangzhou**

Note: Using the tool "IDW" (inverse distance decay): the distance decay parameter is "1" and the threshold travel time is "20 min walking" (about 1400 m) on travel condition of Guangzhou road system.

Source: own draft, 2017. Population data source: Sixth census of Guangzhou, 2010. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes of Guangzhou. Location and supply of medical facilities: <https://map.baidu.com/>; <http://yyk.99.com.cn/guangzhou/> [access on June, 2017].



**Fig. 7.17 Accessibility score of key medical facilities: the gravity-based ratio of available physicians in key hospitals to demanded population within the threshold travel time  $d_0 = 20$  min bus, Guangzhou**

Note: Using the tool "IDW" (inverse distance decay): the distance decay parameter is "1" and the threshold travel time is "20 min bus" (about 7000 m) under travel conditions on Guangzhou road system.

Source: own draft, 2017. Population data source: Sixth census of Guangzhou, 2010. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes of Guangzhou. Location and supply of medical facilities: <https://map.baidu.com/>; <http://yyk.99.com.cn/guangzhou/> [access on June, 2017].

#### 7.2.1.4 Sub conclusion

Having analysed the service area of medical facilities, the travel time of surveyed residents to access medical facilities and the accessibility of available physicians within a threshold travel time, we summarize the findings below:

**Accessibility to basic medical facilities:** The location of basic medical facilities is close to social housing communities. Most communities are located within a service area of 40 min-walking of facilities. And high percentage (around 80%) of respondents from the surveyed social housing communities near the city centre, in Liwan and Haizhu district, indicates an obvious advantage in accessing basic medical facilities in a short travel time (within 20 min) and an easy travel mode (by walking). However, the percentages of respondents from communities in Tianhe and Baiyun, and particularly those from surveyed communities which were built after 2010, represent a much lower level with a clear gap in the rate of centrally located and older communities. Therefore, it is highly possible that residents in most social housing communities may access basic healthcare within a 40-min walk, and those in communities near the city centre have advantages. However, the ratio of available physicians to demand population in social housing communities, remains at a low level when compared with the ratio of other locations in the city of Guangzhou. This may indicate that within 20 min travel time (either by walk or by bus), accessibility of social housing residents to available basic physicians is not as high as people in the central city area. The accessible number of physicians for basic healthcare is much less for current residents in social housing communities, and is particularly for those people in Tianhe district and very remote regions of Baiyun.

To conclude, residents of social housing communities are not spatially distant from basic healthcare facilities, but they have disadvantages in accessing sufficient numbers of physicians. Within a travel time of 20 minutes, residents in social housing communities (especially those in communities of Tianhe, Baiyun district and communities built after 2010) would find it difficult to reach a comparably equal number of basic physicians as people in the central area of Guangzhou.

**Accessibility of key medical facilities:** Most social housing communities surveyed are located within a service area of 40-60 min-walking or 20-40 min-bus of key hospitals. Residents of social housing communities may take longer travel time (40-60 min) or use faster vehicles (e.g. bus or metro) in reaching key hospitals than accessing basic medical facilities. In addition, within a threshold travel time of 20 min-bus, the accessibility value of most surveyed social housing communities (except communities in Tianhe and remote Baiyun district) reach an average level in comparison to other locations in the city area. This means most social housing residents (except those in Tianhe and remote Baiyun district) can access a certain number of available physicians at key hospitals within 20 min by bus; although the number is not as high as people in the central city area, there is no notable disadvantage.

To conclude, there is seems no evidence to show that social housing residents experience any disadvantages in accessing key hospitals. Apart from residents of specific projects, like communities in Tianhe district and in the remote region of Baiyun district, the majority of social housing residents can access an average level of physicians at key hospitals within 20 min-bus travel. Although the distribution of key medical facilities requires longer travel time or faster vehicles from social housing residents, it corresponds to the location economics of CPT (central place theory). The upper-level facilities serve a larger area while the lower-level facilities serve a small area. The demand population may require a longer time to reach higher level settlements like the hospitals. The distribution of key hospitals also obeys this location principle. However, most residents in social housing communities may experience some difficulties in reaching available physicians for basic healthcare. And residents of communities in Tianhe district (e.g. Tangde, Guangdan, Tai'an and Anxia) and communities in very remote locations (e.g. some new projects lie on middle or northern region of Baiyun) may suffer severe difficulties in accessing both basic medical facilities and key hospitals.

#### 7.2.2 Accessibility of middle schools

Middle school refers to higher-level education and people are inclined to choose the most suitable school rather than the nearest one. In this study, we divided middle schools into two categories: key middle schools and basic middle schools. Depending on the educational quality and faculty, key middle schools in Guangzhou are designated either national classic, provincial classic or urban classic; the rest of the middle schools are regarded as the basic middle schools (refer to their locations in Fig.7.18). In the search for upper-level education, people may accept long distances when accessing key middle schools. In addition, the distribution of key middle schools may also influenced by CPT

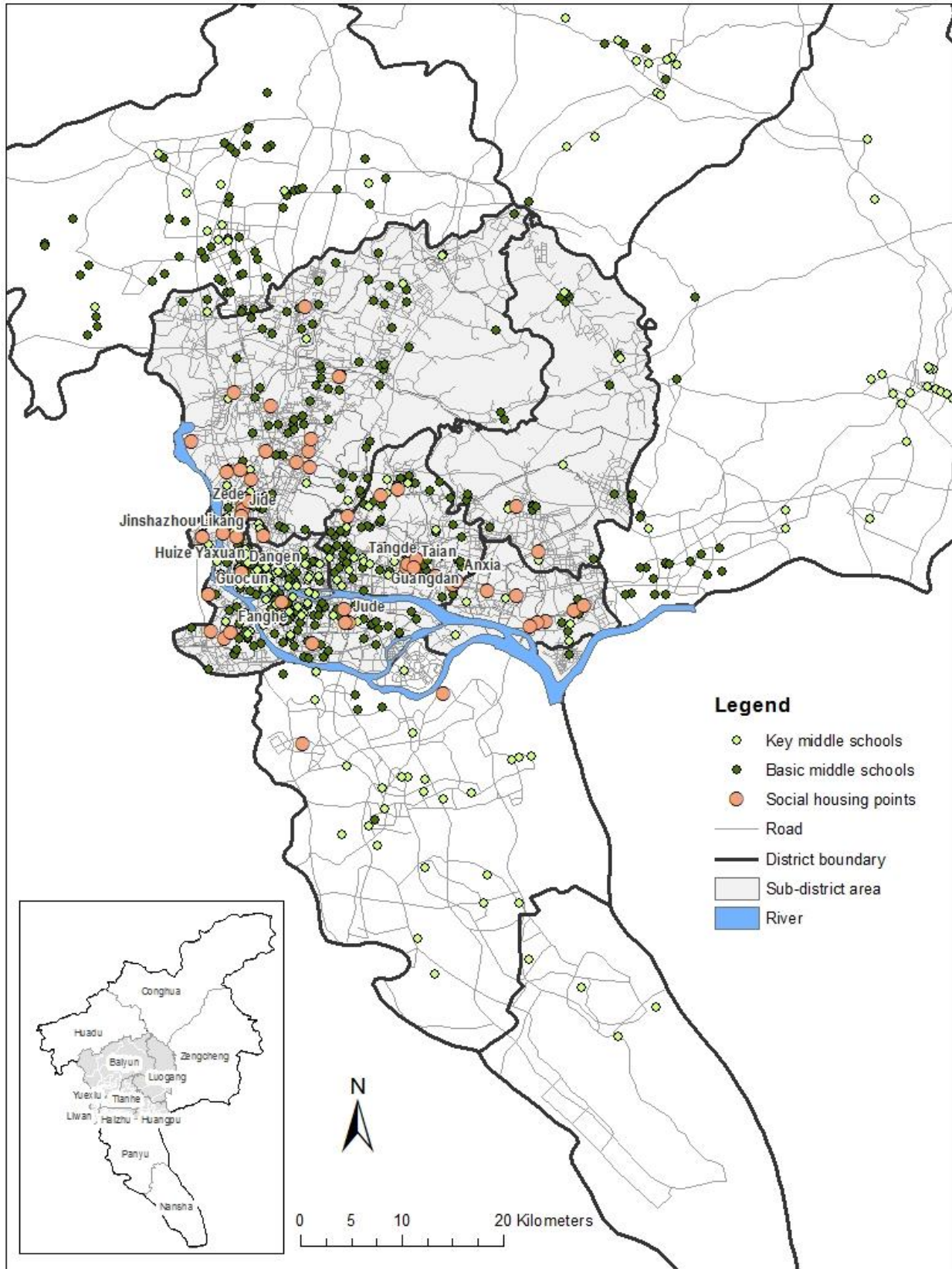
(central place theory), in that key middle schools may serve a larger market area while basic middle schools serve a smaller market area. Taking more time to reach key middle schools may not respond to an unjust distribution. Therefore, classified analyses on accessibility to two groups would be helpful for ascertaining whether residents really have difficulties accessing middle schools. The study of accessibility to middle schools consists of two parts: the service area (ArcGIS-based analysis) of common middle schools and key middle schools, and the required travel time of the 660 respondents (survey-based analysis) in accessing middle schools.

#### **7.2.2.1 Service area of middle schools: ArcGIS-based analysis**

Residents of the social housing communities surveyed can walk to the nearest basic middle school, and for most of them (except Guangdan and Huize Yaxuan) this takes less than 40 minutes. But the new social housing projects on the remote periphery, like the middle southern area of Huangpu district and middle area of Baiyun district, display disadvantages in reaching middle schools in that 20–60 min travel by bus is required. According to Fig.7.19 about the service areas of common middle schools, eleven surveyed communities are situated in a service area of 20–40 min-walking, Guangdan and Huize Yaxuan are located within a service area of 40–60 min-walking. The residents in these communities surveyed could reach the nearest middle school within 40 min on foot, and residents of Guangdan and Huize Yaxuan might take a little longer (40–60 min) when they walk to the middle school. Among 38 uncompleted social housing projects, only a few near the city centre are located in areas where residents can walk to basic middle school in 20–40 min. The rest are located mainly in service areas of 20 min-bus, and very remote projects in the peripheral suburbs (e.g. Miaopu of Huangpu district, Yuquan, Yunshan, Jiahe Lianbian of Bianyun district) are situated in even larger service areas of 20–40 min-bus and 40–60 min-bus. So people in these places should take 20–60 min bus to the nearest middle school.

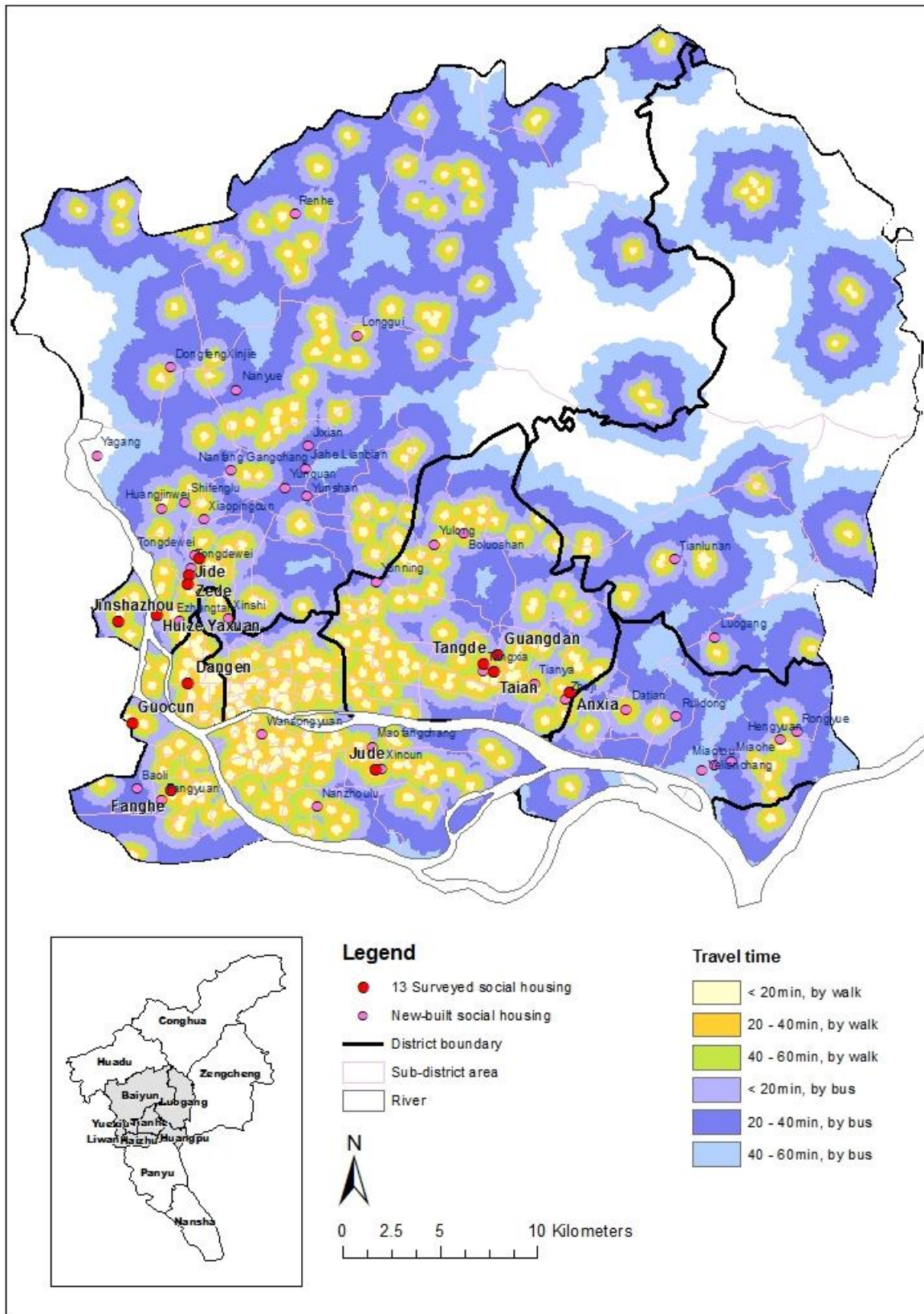
With respect to accessing key middle schools, there are clear disparities between social housing communities near the city centre and those in remote locations (see Fig.7.20). Residents of communities near the city centre (e.g. Dang'en, Jude, Jinshazhou and Zede) can reach key middle schools by walking and around 20–40 minutes. Another six surveyed communities (i.e. Fanghe, Tangde, Tai'an, Jide, Huize Yaxuan and Likang) are situated within service areas of 20 min-bus, and Guangdan and Anxia lie within the area of 20–40 min-bus. In addition, most of the new projects are located on services area of 20–40 min-bus or 40–60 min-bus. Very remote social housing projects in Baiyun and Huangpu display disadvantages in reaching key middle schools. The results imply that the accessibility of social housing residents to key middle schools linked to the housing location. Most residents in the surveyed communities can reach key middle schools by 20 min-bus. Living in communities that are near the city centre may mean that residents take less time to access such schools. Whereas, living in communities in remote Baiyun and Huangpu, residents may suffer disadvantages (longer travel time by bus) in accessing key middle schools.





**Fig. 7.18 Distribution of middle schools in Guangzhou**

Source: own draft, 2017. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes and location of middle schools of Guangzhou.

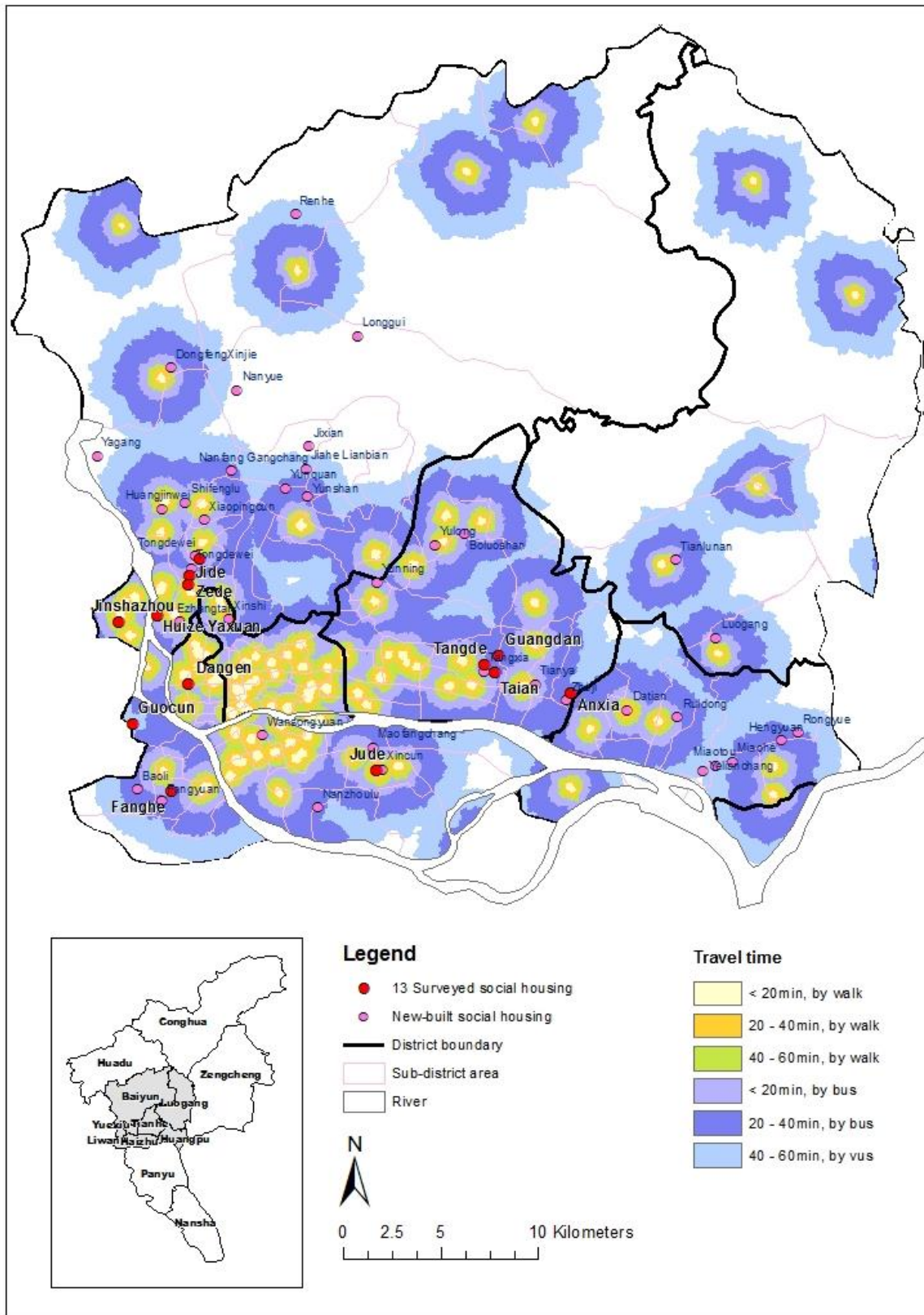


**Fig. 7.19 Service areas of basic middle schools, by travel time and travel mode, Guangzhou**

Note: Analysed with “Cost Distance” in ArcGIS, see details in 7.1.3.

Source: own draft, 2017. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes and location of middle schools of Guangzhou.





**Fig. 7.20 Service areas of key middle schools, by travel time and travel mode, Guangzhou**

Note: Analysed with “cost distance” in ArcGIS, see details in 7.1.3.

Source: own draft, 2017. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes and location of middle schools of Guangzhou.

### 7.2.2.2 Travel convenience to middle schools: survey-based analysis

Surveys of travel time and travel mode can reflect real travel behaviours of surveyed residents in social housing communities in accessing middle schools. We summarized the percentages of respondents by location, time of construction, scale and dwelling mode of communities (see Tab.7.4), to identify the differences between them.

**Tab. 7.4 Percentages of surveyed residents by travel time and by travel mode to access middle schools, by location, time of construction, scale and dwelling mode**

Accessibility		Travel time			Travel mode				
		<20min	20-40 min	>40 min	by foot	by bicycle	by mopeds	by bus or metro	by car
Location	Liwan	86.9%	8.5%	4.6%	96.9%	0.0%	0.0%	3.1%	0.0%
	Haizhu	83.5%	16.5%	0.0%	82.5%	1.0%	1.0%	15.5%	0.0%
	Tianhe	56.6%	34.5%	9.0%	67.6%	9.0%	0.7%	20.7%	2.1%
	Baiyun	67.2%	20.2%	12.6%	70.2%	7.6%	2.1%	18.5%	1.7%
Time of construction	From 1998	76.0%	20.8%	3.1%	80.6%	3.1%	0.3%	14.9%	1.0%
	2008-2010	78.4%	12.6%	8.9%	84.0%	5.9%	1.9%	7.1%	1.1%
	After 2010	11.3%	58.5%	30.2%	24.5%	13.2%	1.9%	58.5%	1.9%
Scale <sup>a</sup>	Big scale	74.4%	16.2%	9.4%	83.8%	3.0%	1.3%	10.1%	1.7%
	Medium scale	68.9%	28.0%	3.1%	73.8%	5.3%	0.4%	19.6%	0.9%
	Small scale	68.2%	15.9%	15.9%	63.6%	12.5%	2.3%	21.6%	0.0%
Dwelling mode <sup>b</sup>	Fully mixed	76.0%	20.8%	3.1%	80.6%	3.1%	0.3%	14.9%	1.0%
	Semi-mixed	74.1%	15.4%	10.5%	83.4%	4.0%	1.6%	9.3%	1.6%
	Single	45.3%	36.0%	18.7%	44.0%	17.3%	2.7%	36.0%	0.0%

Note: <sup>a</sup> Categories of scale are natural break which is based on the population of social housing communities, large scale refers to communities with over 4000 residents; medium scale refers to a range of 1500–4000; and small scale refers to < 1500 population. <sup>b</sup> Fully mixed refers to three different types of household (early social housing: ANJU housing, low-rent housing and affordable housing) mixed in communities. Half mixed refers to two kinds of social housings (low-rent housing and affordable housing) which are spatially integrated in the same community but located in different buildings and normally separated by paths. Single community means a small social housing community built after 2008, which comprises only affordable housing.

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B3 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

A higher percentage of respondents in communities in Liwan and Haizhu district can walk to reach a middle school within 20 minutes. However, there is a gap in the category of Tianhe and Baiyun for the percentage of respondents that can access a middle school within 20 min and on foot. 86.9% respondents in Liwan and 83.5% in Haizhu were able to reach middle schools in 20 min, but this ratio dropped to 56.6% in Tianhe and 67.2% in Baiyun. This indicates that respondents in communities near the city centre (in districts of Liwan and Haizhu) have some advantages in accessing middle schools. In addition, this convenience also demonstrates in the higher percentage of respondents (96.9% in Liwan and 82.5% in Haizhu) who used the easier travel mode of walking. The percentages are only 67.6% in Tianhe and 70.2% in Baiyun. We may perceive that residents of social housing communities near the city centre (such as Liwan and Haizhu) may have certain advantages in terms of shorter travel times and easier travel mode than those in remote communities in Tianhe and Baiyun.

Respondents in newer communities (built after 2010) indicated a notable gap in accessing middle schools to those in old communities (built from 1998 and in 2008–2010). The ratio of respondents who was able to reach schools within 20 min was 76.0% (communities built from 1998) and 78.4% (communities built in 2008–2010) respectively. Only 11.3% of surveyed residents in communities built after 2010 could access middle schools within 20 min, while 58.5% took 20–40 min and 30.2% took over 40 min. Moreover, this gap also appears in disparities between travel modes. While over 80% of respondents in old communities walked to middle school, only 24.5% of respondents in new communities built after 2010 indicated they went on foot, and 58.5% of them took bus. The much lower percentages of respondents with short travel time (<20 min) and slow travel mode (walking) may clarify the disadvantages of residents of new communities in accessing middle school.

Nevertheless, respondents in communities with a single dwelling mode represented lower percentages in the category “< 20 min” and “by foot”. In comparison with the higher rate of fully mixed communities (76.0%) and semi-mixed communities (74.1%), the ratio of residents who could reach middle school in 20 min was only 45.3%. A similar disparity is found when selecting a travel mode of slow walking: while 80.6% and 83.4% respondents (in fully mixed and in semi mixed communities, respectively) travelled on foot, only 44.0% respondents in single communities walked to middle schools. These survey results imply that residents of single communities may suffer some disadvantages in reaching middle schools.

#### **7.2.2.3 Sub conclusion**

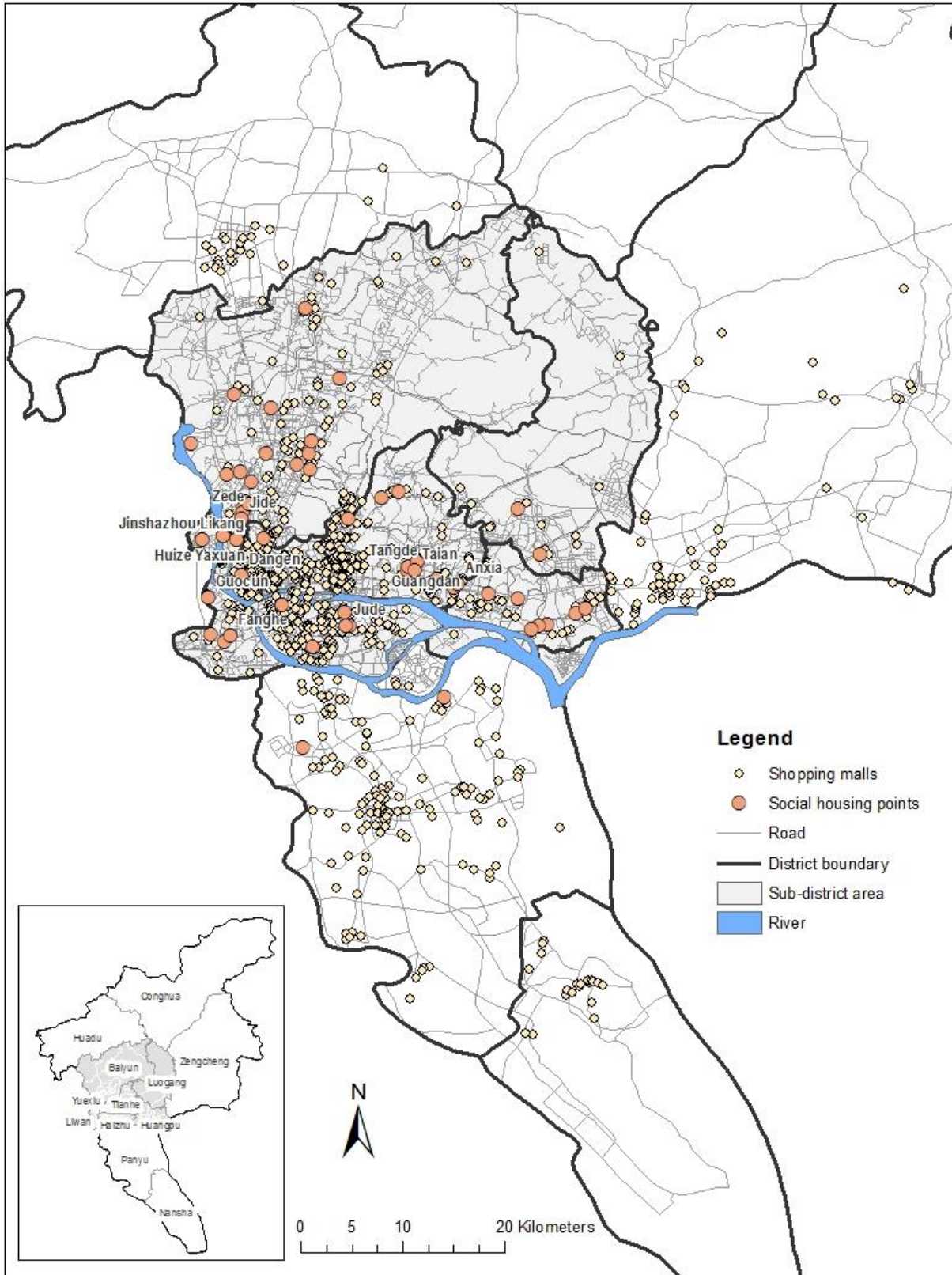
To conclude, apart from the inconvenience experienced by residents in new communities built after 2010 (i.e. Guangdan, Anxia and Huize Yaxuan), residents of the other 10 surveyed social housing communities have no significant disadvantages in accessing basic middle schools. Their distance to basic middle schools and the required travel time are comparable with people of the central area of Guangzhou. Only new communities built after 2010 (Guangdan, Anxia and Huize Yaxuan) show some disparities.

Residents of several communities near the city centre have good accessibility to key middle schools, while residents of other communities, particularly remotely located ones, may experience disadvantages. Most social housing communities are located a bit far from the service areas of key middle schools, but their residents can reach these schools by 20 min-bus. Longer travel time or faster travel mode is required when accessing key middle schools than when accessing basic middle schools. In addition, accessibility to key middle school reduces as the location of communities becomes more remote. There are notable disparities between social housing communities located near to the city centre and those distant from it. This indicate that locations near the city centre (e.g. Dangen, Jude) may have superior advantages when accessing key middle schools. The farther the community from the city centre, the more inconvenience the residents may suffer in accessing key middle schools.

### **7.3 Accessibility of least accessible facilities (LEA)**

#### **7.3.1 Accessibility of shopping malls**

The distribution of shopping malls in Guangzhou is shown in Fig.7.21. The shopping mall is a comprehensive commercial centre. The establishment of a shopping mall depends on the marketing potential and consumers in demand locations. The shopping malls in Guangzhou are highly concentrated in the central area which consists of Yuexiu district, western Haizhu, western Tianhe and eastern Liwan (see Fig.7.21). The inner city area and new CBD (in Tianhe district) have an intensive commercial environment and plenty of shopping malls compared to the peripheral area. Then settlements extend to outer suburbs in three directions: the northern belt goes to the Baiyun district, the eastern belt goes through the Tianhe and Huangpu districts, and the southern belt goes down to central Panyu.



**Fig. 7.21 Distribution of shopping malls in Guangzhou**

Source: own draft, 2017. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes and location of shopping malls of Guangzhou.

### 7.3.1.1 Service area of shopping malls: ArcGIS-based analysis

Using the cost distance method based on the road system (see details in Chapter 7.1.3), we drafted the six service areas of each shopping mall within defined travel times (see Fig.7.22). The surveyed communities near the city centre (Dang'en, Jude, Fanghe and Guocun) have advantages in terms of short distances to shopping malls. These four communities are located within a 20 min-walking service area of facilities. At the same time, other uncompleted projects in Haizhu district (e.g. Wansongyuan, Nanzhoulu and Maofangchang) are also situated within a 20 min-walking service area. This indicates that residents of communities near the city centre are able to reach the nearest shopping malls within 20 minutes on foot. Residents of four communities in Tianhe district (Tangde, Guangdan, Tai'an and Anxia) have a longer distance to shopping malls, and they require a bit more travel time (40–60 min) if going on foot. However, the communities in Baiyun district demonstrate a clear disadvantage in accessing shopping malls. Zede, Jide, Likang and Jinshazhou are located within a service area of 20–40 min-bus or 40–60 min bus. This implies that residents in these communities should take a faster travel mode or take a longer time to access malls than residents of communities near the city centre. The neighbouring areas of these places lack shopping malls and residents may encounter certain difficulties in reaching shopping malls.

### 7.3.1.2 Travel convenience to shopping malls: survey-based analysis

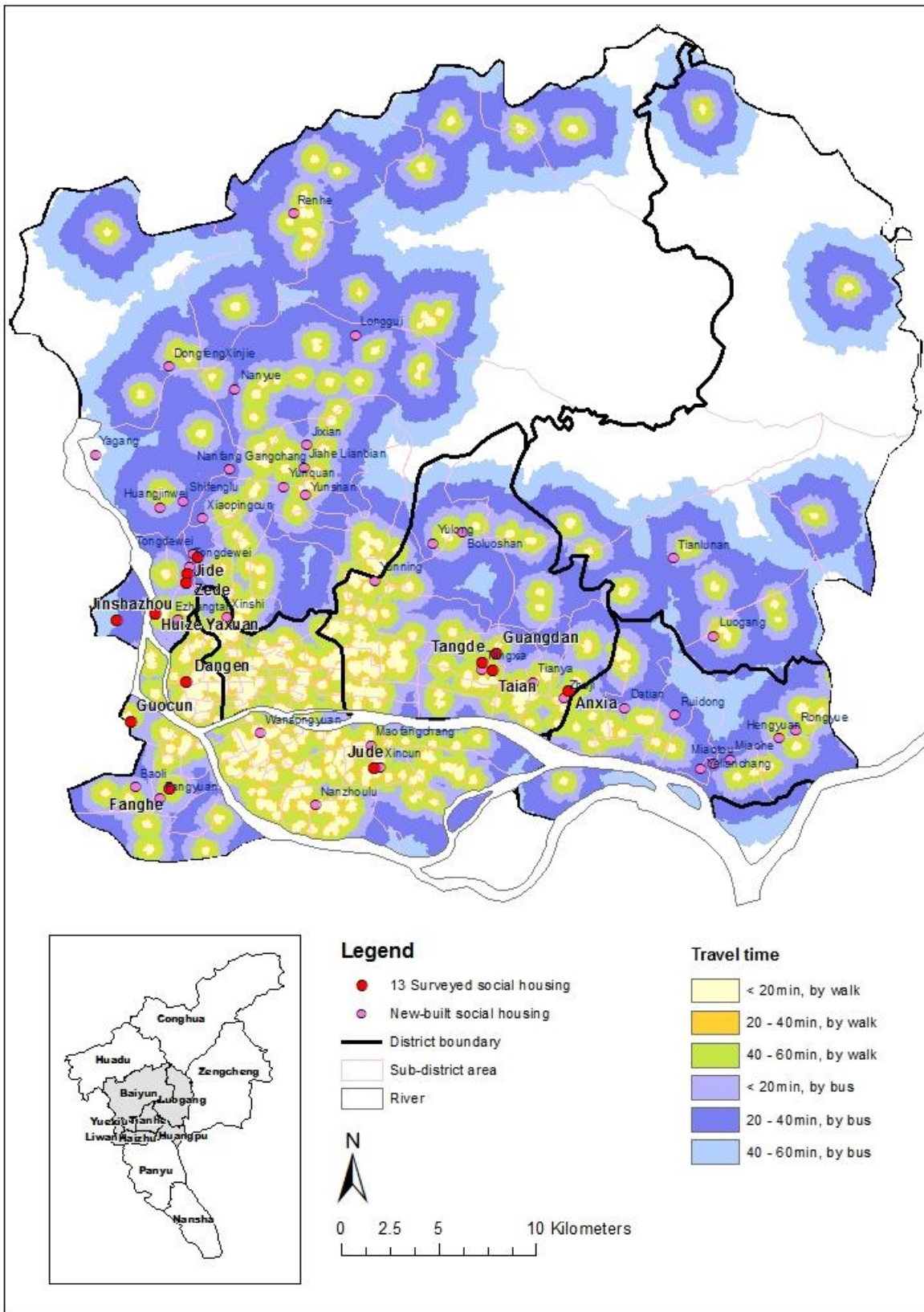
Travel time and travel mode to access shopping malls indicated by the 660 surveyed residents also indicates the disparity in accessibility to shopping malls between communities near the city centre (in district Liwan and Haihzu) and those in peripheral areas (in district Tianhe and Baiyun). Respondents in communities in Baiyun district replied that they had significant disadvantages in accessing malls, while people surveyed in Liwan district reflected greater accessibility.

Tab.7.5 shows that 66.7%, 53.5% and 44.3% respondents, from Liwan, Haizhu and Tianhe respectively, stated they were able to reach such facilities within 20 min. The percentage of respondents who were able to reach a mall in 20 min dropped to 26.3% in Baiyun district. Meanwhile, a lower percent of respondents in Baiyun district travelled on foot (28.6%), while a higher percent of surveyed people in Liwan and Tianhe (64.4% and 52.5% respectively) walked to shopping malls. The result shows that it is highly possible that residents of communities in Baiyun experience disadvantages in accessing shopping malls.

Nevertheless, the percentages in communities built after 2010 for the categories travel time “<20 min” and travel mode “by foot” represented lower levels (25.0% and 16.7% respectively) than the percentage of old communities (communities built from 1998: 43.9% and 32.3%; communities built in 2008-2010: 47.2% and 52.8%). Seventy-five per cent of respondents in new communities built after 2010 said reaching shopping malls took over 20 minutes, and 65% indicated they travel by bus. The fact that more of them took longer time and used a faster travel mode may reflect that residents of new communities (Guangdan, Anxia and Huize Yaxuan) have certain disadvantages in accessing shopping malls.

To sum up the results pertaining to service area and survey data, we recognize that communities in Baiyun and those built after 2010 may be lacking in terms the shopping malls provided in the surrounding areas. These areas lack shopping mall facilities, which means residents have lower accessibility. Increasing the number of shopping malls in these areas (particularly Baiyun district) would be very helpful for reducing the disparity among residents in terms of reaching shopping malls.





**Fig. 7.22 Service areas of shopping malls, by travel time and travel mode, Guangzhou**

Note: Analysed using “cost distance” in ArcGIS, see details in 7.1.3.

Source: own draft, 2017. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes and location of shopping malls of Guangzhou.

**Tab. 7.5 Percentages of surveyed residents by travel time and by travel mode to access shopping malls, by location, time of construction, scale and dwelling mode**

Accessibility		Travel time			Travel mode				
		<20min	20-40 min	>40 min	by foot	by bicycle	by mopeds	by bus or metro	by car
Location	Liwan	66.7%	25.8%	7.6%	64.4%	0.0%	0.0%	32.6%	3.0%
	Haizhu	53.5%	46.5%	0.0%	13.1%	6.1%	2.0%	77.8%	1.0%
	Tianhe	44.3%	43.7%	12.0%	52.5%	9.5%	1.9%	33.5%	2.5%
	Baiyun	26.5%	46.5%	26.9%	28.6%	9.4%	1.6%	55.1%	5.3%
Time of construction	From 1998	43.9%	45.2%	10.9%	32.3%	4.0%	1.7%	59.1%	3.0%
	2008-2010	47.2%	34.3%	18.5%	52.8%	8.5%	1.5%	33.2%	4.1%
	After 2010	25.0%	55.0%	20.0%	16.7%	15.0%	0.0%	65.0%	3.3%
Scale <sup>a</sup>	Big scale	38.8%	39.5%	21.7%	41.8%	6.6%	1.0%	47.0%	3.6%
	Medium scale	49.6%	45.0%	5.5%	35.7%	8.0%	2.1%	52.5%	1.7%
	Small scale	43.5%	39.1%	17.4%	42.4%	5.4%	1.1%	43.5%	7.6%
Dwelling mode <sup>b</sup>	Fully mixed	43.9%	45.2%	10.9%	32.3%	4.0%	1.7%	59.1%	3.0%
	Semi-mixed	42.4%	38.0%	19.6%	50.0%	8.4%	1.2%	36.4%	4.0%
	Single	45.7%	38.3%	16.0%	34.6%	13.6%	1.2%	46.9%	3.7%

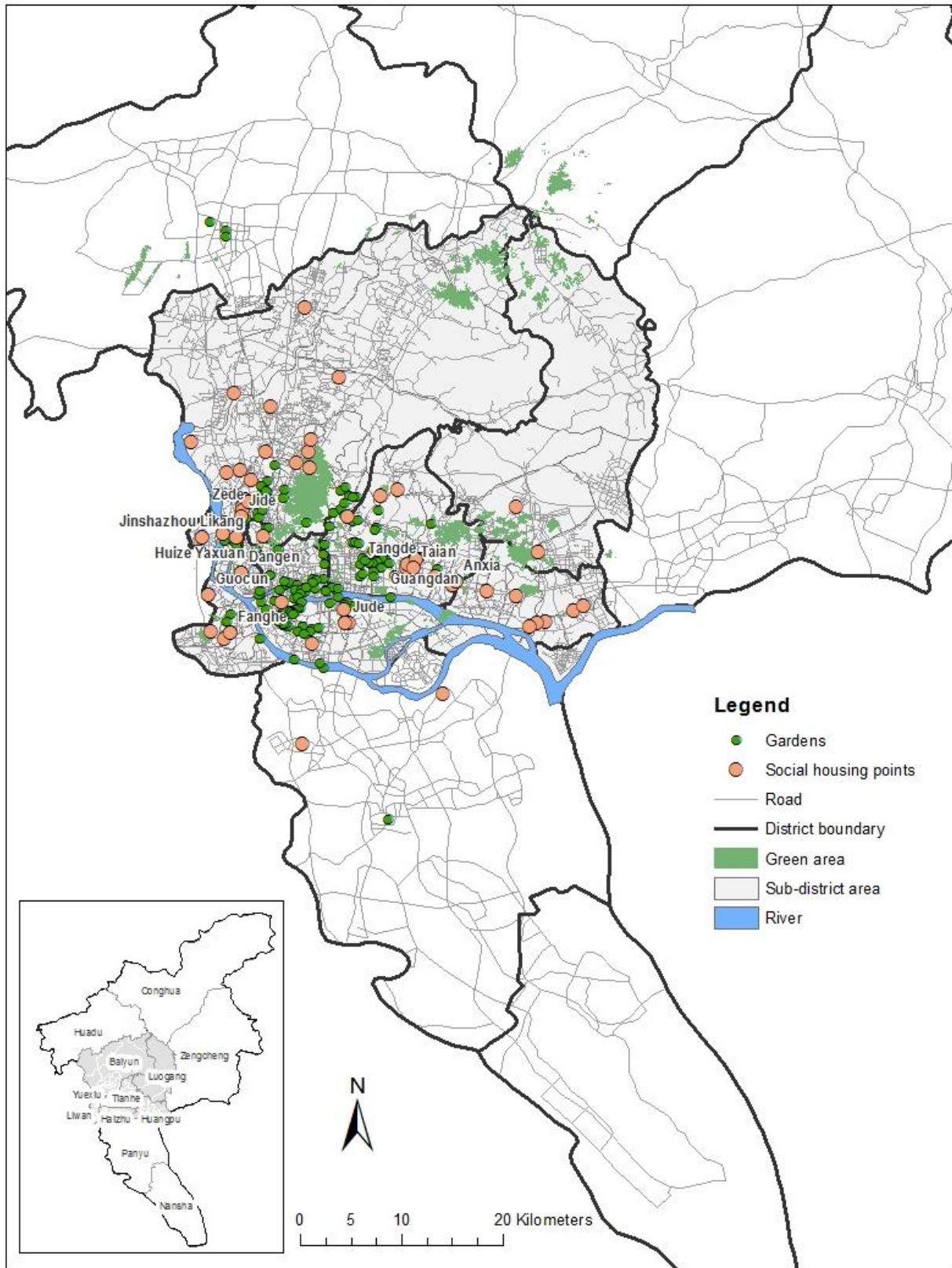
Note: <sup>a</sup> Categories of scale are natural break which is based on the population of social housing communities, large scale refers to communities with over 4000 residents; medium scale refers to a range of 1500–4000; and small scale refers to < 1500 population. <sup>b</sup> Fully mixed refers to three different types of household (early social housing: ANJU housing, low-rent housing and affordable housing) mixed in communities. Half mixed refers to two kinds of social housings (low-rent housing and affordable housing) which are spatially integrated in the same community but located in different buildings and normally separated by paths. Single community means a small social housing community built after 2008, which comprises only affordable housing.

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B6 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

### 7.3.2 Accessibility to the nearest park

Park facilities in this study include gardens and green areas. Gardens are scattered in the city area and large-scale green are concentrated in peripheral areas like Baiyun, middle Haizhu, western Liwan, southeast Tianhe and Luogang district (see Fig.7.23). We explore the accessibility to parks by means of two questions: defining the service area to find out the spatial distance of social housing communities from parks; and analysing the survey data from 660 respondents to understand the convenience or difficulties experienced by respondents in travelling to parks.





**Fig. 7.23 Distribution of gardens and green areas in Guangzhou**

Source: own draft, 2017. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes and location of gardens and green area of Guangzhou.

### 7.3.2.1 Service area of parks: ArcGIS-based analysis

To depict the service area of parks a cost distance approach was selected (see details in Chapter 7.1.3). For travel time, we draw six level buffers around the location of gardens and parks (see Fig.7.24). Except for Jinshazhou and Guocun, the rest of 13 surveyed communities are located mainly within a service area of 20–40 min-walking. Jinshazhou and Guocun are situated within a large service area of 20–40-bus and display less proximity to parks. Accordingly, to reach the nearest parks, residents of Jinshazhou and Guocun may have a clear disadvantage in terms of spatial distance to parks than the other eleven communities. Residents in Jinshazhou and Guocun have to go by bus while those in other communities can reach parks on foot. In addition, the accessibility of 38 uncompleted new projects demonstrate disparities. Some projects in southern Huangpu district (e.g. Hengyuan, Yelianchang, Miaohe and Miaotou) and some projects in the middle and northern Baiyun district (e.g. Huangjinwei, Shifenglu, Yagang and so on), show notable disadvantages in reaching parks. The accessibility of these projects is much lower than others, and residents in these locations may take 20-40 min bus or even longer to reach the nearest park.

### 7.3.2.2 Travel convenience to parks: survey-based analysis

As is apparent from the survey data on travelling to parks, respondents in the surveyed communities in Baiyun district have obvious disadvantages in accessing parks. There is no big differences in the percentage of respondents in Liwan, Haizhu and Tianhe regarding the category of travel time “<20 min”, with 60.3%, 53.3% and 50.6% respectively being able to reach the nearest park within 20 minutes (see Tab.7.6). But the ratio displays a notable drop among respondents of Baiyun district, with only 29.1% of them being able to access a park in 20 minutes, while 26.5% of them required over 40 minutes. At the same time, a lower percent (36.8%) of respondents in communities in Baiyun travelled on foot. In Liwan and Haizhu, 54.4% and 72.7% respondents respectively chose to walk to parks. The fact that a lower percentage of respondents took a shorter time (reach within 20 min) and used a slower travel mode (on foot) may indicate that residents who live in social housing communities of Baiyun district may experience some disadvantages in travelling to parks.

Residents of social housing communities in Baiyun district and the Guocun community seem to experience certain inconvenience when travelling to parks. An analysis of the service area shows that most of the social housing communities (except for Jinshazhou and Guocun) are located at a similar distance to the nearest parks. Jinshazhou and Guocun, on the other hand, are located a bit further away from parks. The surveyed data indicates that respondents in peripherally located communities (e.g. in Baiyun district) responded that they had a lower accessibility, which is certified by the higher percentage of respondents using longer travel time and faster vehicles.

To conclude, access to parks by residents in communities in Baiyun is lower than for residents in other communities. The new projects in the region of southern Huangpu and middle and northern Baiyun are also located a long distance from parks. Residents in these locations may therefore suffer difficulties in accessing parks.

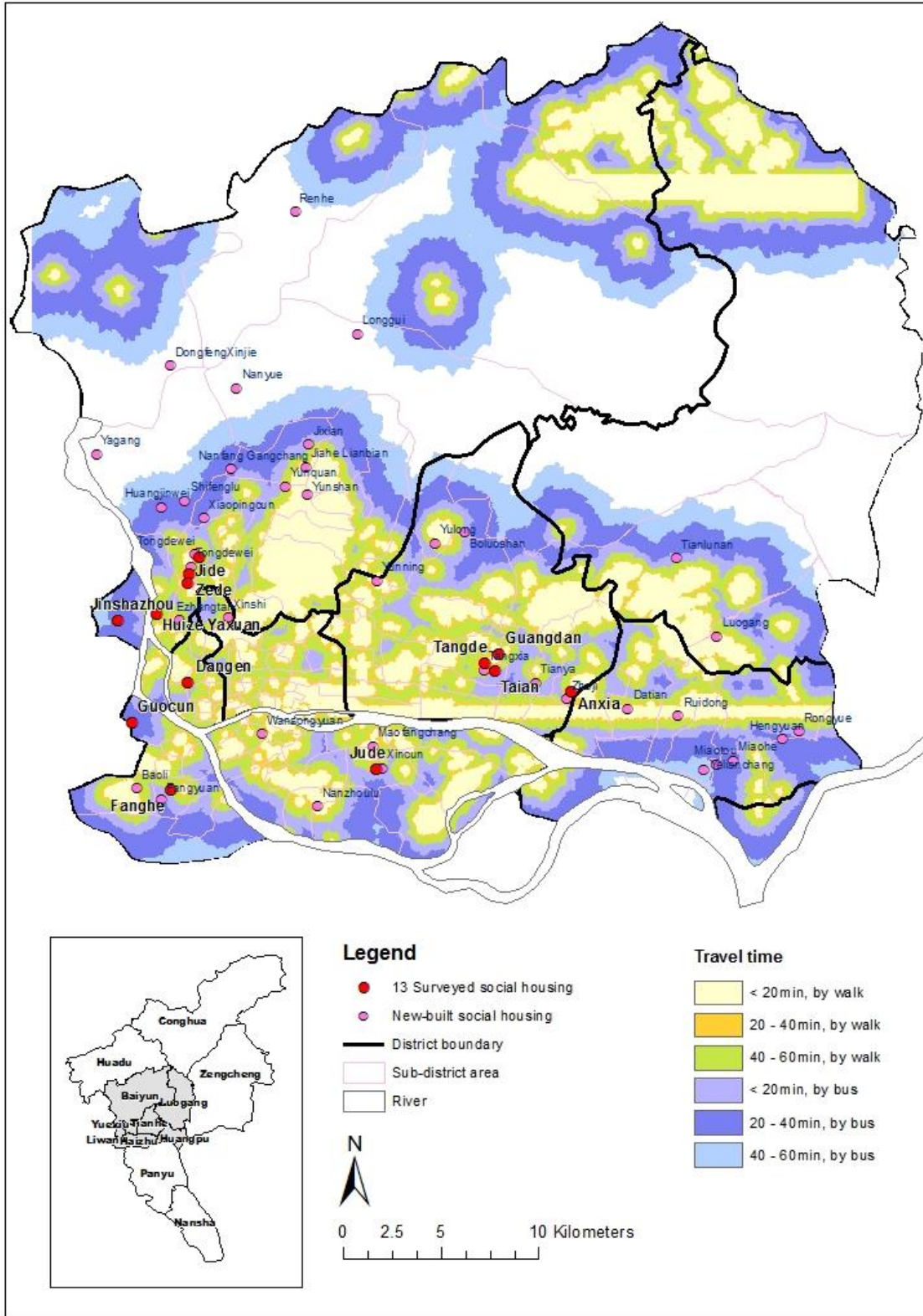


Fig. 7.24 Service areas of gardens and green area, by travel time and travel mode, Guangzhou

Note: Analysed with cost distance in ArcGIS, see details in 7.1.3.

Source: own draft, 2017. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes and location of gardens and green area of Guangzhou.

**Tab. 7.6 Percentages of surveyed residents by travel time and by travel mode to access the nearest park, by location, time of construction, scale and dwelling mode**

Categories		Travel time			Travel mode				
		<20min	20-40 min	>40 min	by foot	by bicycle	by mopeds	by bus or metro	by car
Location	Liwan	60.3%	27.9%	11.8%	54.4%	2.2%	0.0%	39.7%	3.7%
	Haizhu	53.5%	46.5%	0.0%	72.7%	4.0%	0.0%	22.2%	1.0%
	Tianhe	50.6%	37.3%	12.0%	44.9%	6.3%	2.5%	42.4%	3.8%
	Baiyun	29.1%	44.4%	26.5%	36.8%	7.6%	2.2%	48.0%	5.4%
Time of construction	From 1998	43.4%	42.4%	14.2%	47.2%	4.2%	1.4%	44.1%	3.1%
	2008-2010	46.8%	38.3%	14.9%	52.0%	7.4%	1.9%	34.2%	4.5%
	After 2010	49.2%	28.8%	22.0%	39.0%	3.4%	0.0%	52.5%	5.1%
Scale <sup>a</sup>	Big scale	39.4%	41.8%	18.8%	46.3%	5.2%	1.4%	42.5%	4.5%
	Medium scale	50.4%	40.3%	9.3%	55.9%	5.1%	1.7%	34.7%	2.5%
	Small scale	51.6%	29.0%	19.4%	36.6%	7.5%	1.1%	49.5%	5.4%
Dwelling mode <sup>b</sup>	Fully mixed	43.4%	42.4%	14.2%	47.2%	4.2%	1.4%	44.1%	3.1%
	Semi-mixed	43.6%	41.6%	14.8%	49.6%	6.4%	1.6%	37.2%	5.2%
	Single	59.0%	20.5%	20.5%	50.0%	7.7%	1.3%	38.5%	2.6%

Note: <sup>a</sup> Categories of scale are natural break which is based on the population of social housing communities, large scale refers to communities with over 4000 residents; medium scale refers to a range of 1500–4000; and small scale refers to < 1500 population. <sup>b</sup> Fully mixed refers to three different types of household (early social housing: ANJU housing, low-rent housing and affordable housing) mixed in communities. Half mixed refers to two kinds of social housings (low-rent housing and affordable housing) which are spatially integrated in the same community but located in different buildings and normally separated by paths. Single community means a small social housing community built after 2008, which comprises only affordable housing.

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B7 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

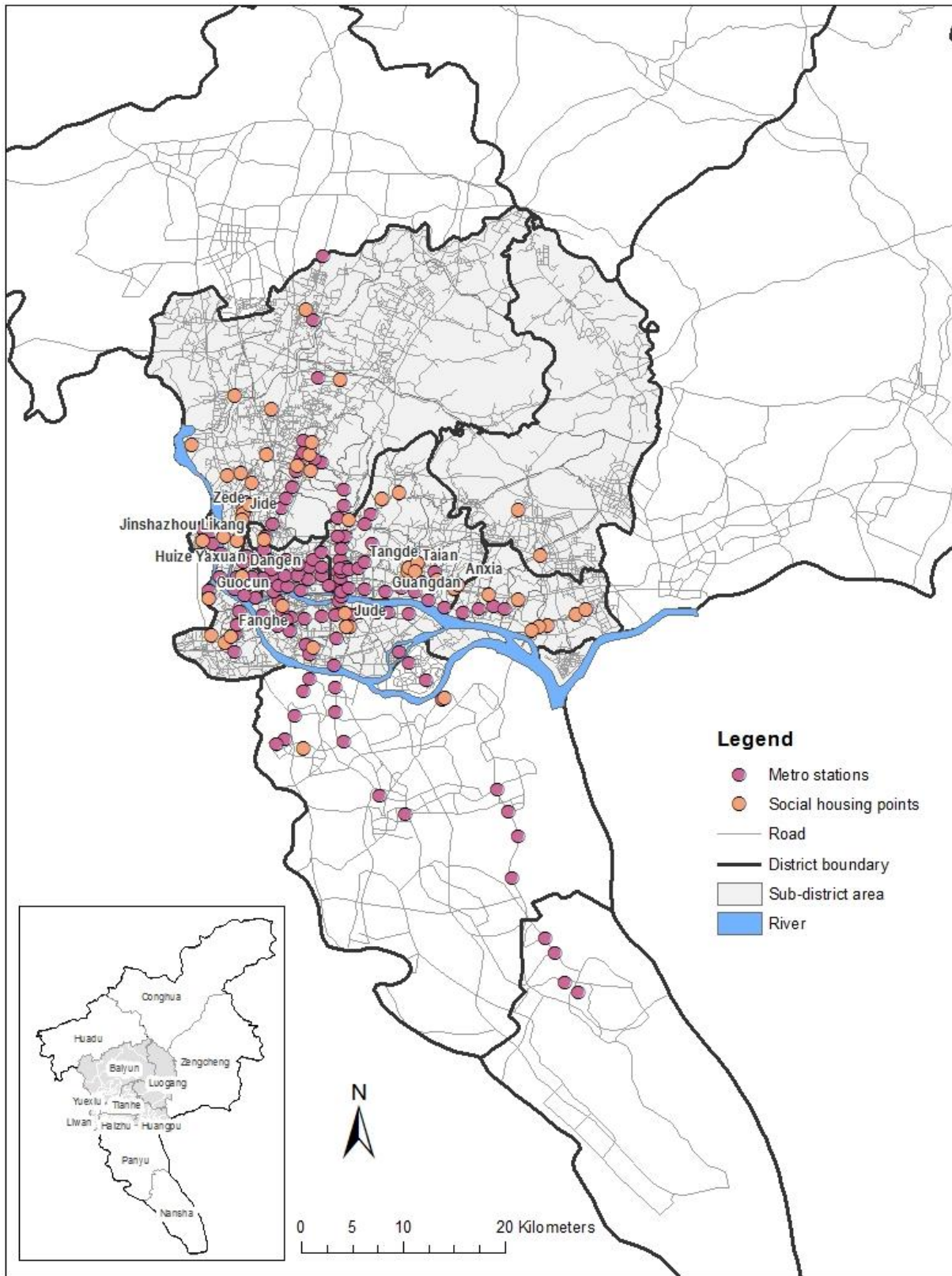
### 7.3.3 Accessibility of nearest metro station

The location of metro stations is highly concentrated in the city centre area and stretches along fixed lines to the suburban areas (see Fig.7.25). Many social housing communities are not close to metro stations, and have to use buses to connect to them. Near the communities of Jinsahzhou and Fanghe, the government has established new metro stations. This study examines accessibility to metro stations which includes the spatial distance of communities and the travel convenience of respondents in reaching the metro stations. We use the service area of metro stations and the travel data of surveyed residents to respond to accessibility.

#### 7.3.3.1 Service area of metro stations: ArcGIS-based analysis

The service area of metro stations is calculated using the cost distance method (see details in Chapter 7.1.3). As shown in Fig.7.26, only Dang'en, Guocuo, Jinshazhou and Fanghe are located in the service areas of 20-40 min-walking. The other nine surveyed communities are mainly located within the service area of 20-40 min-bus and 40-60 min bus. Among 38 new projects, those located near the city centre (e.g. in district of Liwan, Haizhu) are situated which in service areas where metro stations can be reached by walking, whereas those located in remoter regions show large disparities in terms of reaching metro stations. Accessing the nearest station may take residents over 20 min by bus, and some even more than 60 min. Therefore, the results indicate that most communities have some distance to travel to metro station locations and community residents need to go by bus. However, residents of communities near the city centre may enjoy obvious advantages in accessing metro stations.





**Fig. 7.25 Distribution of metro stations in Guangzhou**

Source: own draft, 2017. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes and location of metro stations of Guangzhou.

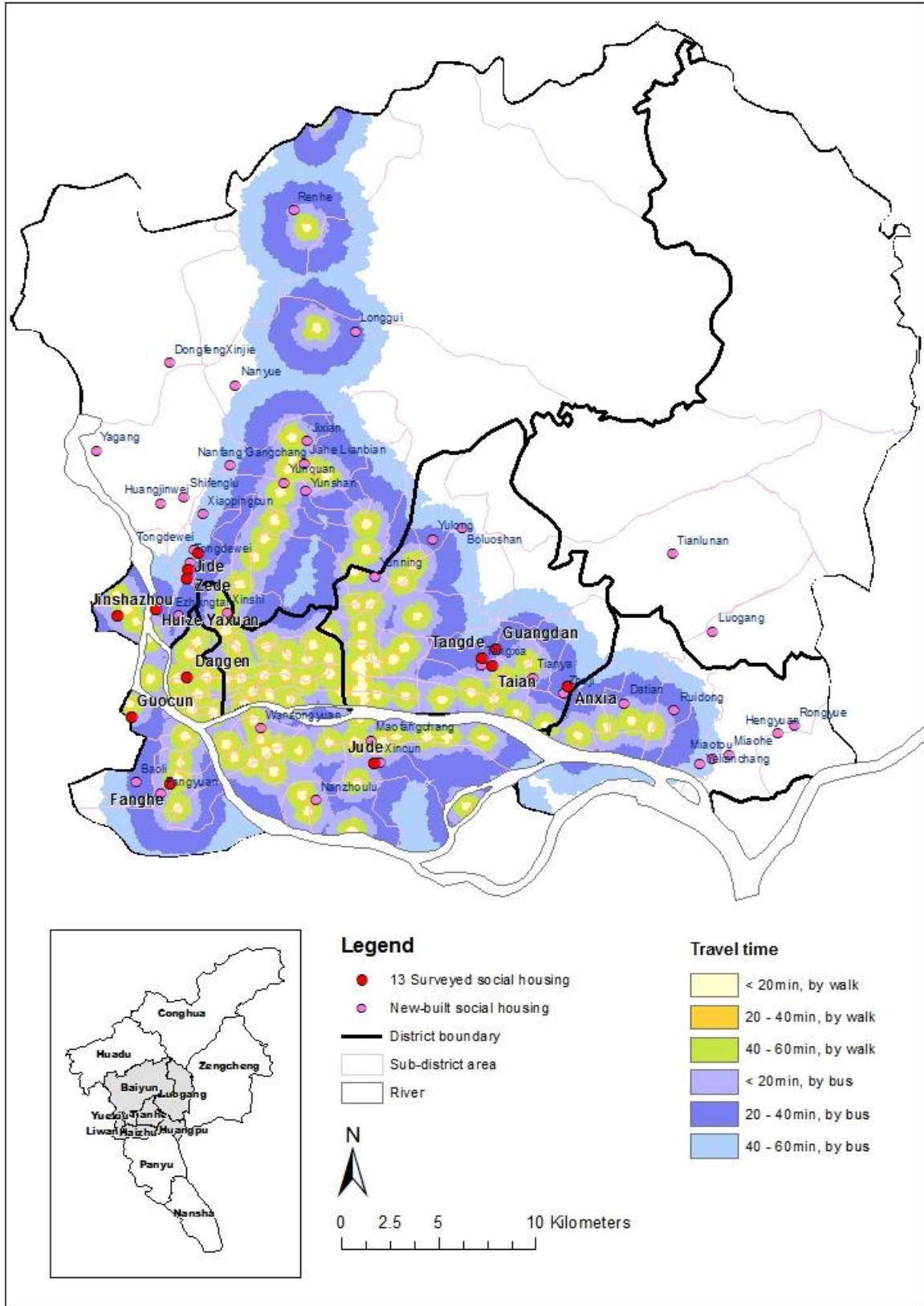


Fig. 7.26 Service areas of metro stations, by travel time and travel mode, Guangzhou

Note: Analysed with "Cost Distance" in ArcGIS, see details in 7.1.3.

Source: own draft, 2017. Map database: Sun-Yat sen University, 2013, GIS database of boundaries, routes and location of metro stations of Guangzhou.

### 7.3.3.2 Travel convenience to metro stations: survey-based analysis

The survey results indicate that respondents in Liwan district and respondents from communities built in 2008–2010 have advantages when accessing metro stations. Up to 88.5% of surveyed people in communities in Liwan district indicated they were able to reach a metro station within 20 minutes, and 98.6% of them travelled on foot. Among respondents in Haizhu district, 66.7% reached a metro station in 20 minutes, and 53.5% chose to walking and another 45.5% to go by bus. The percentages reduced to a lower level among respondents in communities in Tianhe and Baiyun. Only 43.9% (Tianhe) and 32.6% (Baiyun) of surveyed people reached the station within 20 minutes, another 45.8% (Tianhe) and 49.8% (Baiyun) required longer travel time (20–40 min). In addition, fewer respondents travelled on foot (35.5% in Tianhe and 29.6% in Baiyun) and more chose bus as a faster travel mode (51.6% in Tianhe and 58.8% in Baiyun). These data may imply that residents of communities in Liwan district have absolute convenience in accessing metro stations, while those in communities in peripheral areas, particularly in Tianhe and Baiyun, show clear disparities. Secondly, the rate of access of respondents in communities built in 2008–2010 (i.e. Fanghe, Guocun, Dang'en, Jinshazhou, Tai'an and Likang) also indicated easier access to metro stations. To sum up the results of the service area and travel data analysis, there are disparities between communities which appear to be closely associated with their locations. The metro lines are concentrated in the central area, and the communities of Fanghe, Guocun and Dang'en (in Liwan district) are spatially located near to metro stations. Residents of social housing communities situated near the city centre may have advantages in terms of accessing metro stations. Therefore, most these residents enjoy superior convenience in terms of reaching them in a shorter time (in 20 min) on foot, while residents of other social housing communities have to go by bus.

**Tab. 7.7 Percentages of surveyed residents by travel time and by travel mode to access the nearest metro station, by location, time of construction, scale and dwelling mode**

Accessibility		Travel time			Travel mode				
		<20min	20-40 min	>40 min	by foot	by bicycle	by mopeds	by bus or metro	by car
Location	Liwan	88.5%	10.8%	0.7%	98.6%	0.7%	0.0%	0.7%	0.0%
	Haizhu	66.7%	33.3%	0.0%	53.5%	1.0%	0.0%	45.5%	0.0%
	Tianhe	43.9%	45.8%	10.3%	35.5%	7.1%	2.6%	51.6%	3.2%
	Baiyun	32.6%	49.8%	17.6%	29.6%	4.3%	2.1%	58.8%	5.2%
Time of construction	From 1998	49.7%	40.1%	10.2%	29.6%	2.4%	1.0%	65.0%	2.0%
	2008-2010	62.6%	28.6%	8.8%	74.7%	3.7%	1.5%	16.8%	3.3%
	After 2010	27.1%	66.1%	6.8%	39.0%	10.2%	3.4%	44.1%	3.4%
Scale <sup>a</sup>	Big scale	51.2%	36.9%	11.9%	56.0%	1.7%	2.0%	36.9%	3.4%
	Medium scale	52.8%	40.4%	6.8%	36.2%	4.3%	0.9%	57.0%	1.7%
	Small scale	60.2%	32.7%	7.1%	66.3%	8.2%	1.0%	21.4%	3.1%
Dwelling mode <sup>b</sup>	Fully mixed	49.7%	40.1%	10.2%	29.6%	2.4%	1.0%	65.0%	2.0%
	Semi-mixed	61.1%	31.0%	7.9%	75.8%	2.8%	2.0%	16.3%	3.2%
	Single	41.3%	48.8%	10.0%	45.0%	11.3%	1.3%	38.8%	3.8%

Note: <sup>a</sup> Categories of scale are natural break which is based on the population of social housing communities, large scale refers to communities with over 4000 residents; medium scale refers to a range of 1500–4000; and small scale refers to < 1500 population. <sup>b</sup> Fully mixed refers to three different types of household (early social housing: ANJU housing, low-rent housing and affordable housing) mixed in communities. Half mixed refers to two kinds of social housings (low-rent housing and affordable housing) which are spatially integrated in the same community but located in different buildings and normally separated by paths. Single community means a small social housing community built after 2008, which comprises only affordable housing.

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question B9 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

## 7.4 Satisfaction with medical facilities, middle schools and shopping malls

In order to identify whether social justice prevails in social housing, it is important to know whether access to facilities has met residents' demands. The above analysis is based on service area, travel time and travel mode and reflects the accessibility of residents in social housing communities to daily facilities. The results indicate whether facilities are



distributed in such a way that they can be easily reached by community residents. However, accessibility based on spatial proximity is not enough to certify that justice or injustice prevails. Reaching some higher-level facilities (like hospitals, key middle schools, shopping malls etc.) is more difficult than reaching basic facilities like basic clinics, primary education and markets required daily. Because higher-level facilities serve larger areas, it reasonable to expect that longer travel times or faster travel modes may be required. Therefore, we also analyse the satisfaction of the 660 residents from the 13 surveyed social housing communities with the distance and service quality of facilities. When respondents are highly satisfied with the travel time and service of facilities, then this would provide evidence that residents of social housing communities may not experience problems related to injustice when accessing these facilities. If the locations of facilities are difficult to reach, and respondents reply with low satisfaction regarding accessibility, it may imply that residents experience some injustice.

**Tab. 7.8 Percentages of 660 respondents by categories of satisfaction with most accessible facilities**

Facility	Items	Evaluation (%)					Coefficient of variance
		Very satisfied	Satisfied	Normal	Unsatisfied	Very unsatisfied	
Medical facilities	Distance to medical facility "near-far"	30.8	28.6	21.7	9.7	9.2	1.60
	Ability of physicians "comprehensive-simple"	5.6	24.8	46.7	18.2	4.7	0.84
	Reliability of physicians "reliable-unreliable"	5.9	24.8	44.7	19.1	5.5	0.89
Middle schools	Distance to middle school "near-far"	30.8	24.7	32.6	6.4	5.6	1.30
	Faculty of middle school "rich-scarce"	5.6	24.7	59.2	7.4	3.0	0.62
	Educational quality "good-bad"	6.2	20.3	62.3	8.6	2.6	0.61
Shopping malls	Distance to shopping mall "near-far"	17.9	20.8	26.4	21.4	13.6	1.68
	Selling price of shopping mall "cheap-expensive"	5.9	15.6	48.0	22.6	7.9	0.92

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question H20-H40 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

Respondents indicated high satisfaction with the distance to medical facilities and middle schools, while their satisfaction with distance to shopping malls remained at a moderate level. From Tab.7.8, we perceive that the percentage of interviewees who selected positive categories relating to the distance to medical facilities is over 50%, of which 30.8% are very satisfied and 28.6% are satisfied. In addition, 9.7% and 9.2% respondents respectively indicated that they were dissatisfied. The assessment of the distance to middle schools displays a similar results. Accordingly, 38.7% hold positive opinions (17.9% are very satisfied and 20.8% are satisfied) while a similar percentage (35.0%) gave negative evaluations (13.6% are very unsatisfied and 21.4% are unsatisfied).

However, respondents have a relatively moderate attitude regarding the service quality at medical facilities, middle schools and shopping malls. They are not very satisfied with the quality of their services. A lower percentage of respondents felt satisfied with the service at their medical facilities (e.g. ability of physicians and reliability), with only 5.6% and 5.9% selecting the category "very satisfied", and 24.8% and 24.8% selecting "satisfied". Meanwhile, this weakly positive satisfaction is also demonstrated in the assessment of faculty and educational quality of middle schools, where the percentages of "very satisfied" reduce to 5.6% and 6.2% respectively. However, 24.7% and 20.3% respondents indicated that they were satisfied, 59.2% of respondents judged faculty as normal, while 62.3% thought educational quality was normal. Subsequently, overall satisfaction reduces to weakly negative in assessing of selling prices at shopping malls. At the same time, the coefficient of variance represents the degree of dispersion based on the standard deviation of valid data. The variance values of the supply and quality of facilities (medical facilities, middle schools and shopping malls) are smaller. This indicates that respondents have a consistently higher belief that the supply and quality of these three facilities are normal.

#### 7.4.1 Disparity in satisfaction between communities

In order to know the differences in satisfaction levels among respondents from 13 communities, we additionally calculate the values of respondents' satisfaction by location, the time of construction, scale and dwelling mode of the community (see Tab.7.9). This helps us to identify the disparities in satisfaction between respondents in different communities. For a brief view, we have transferred the survey data shown by percentages for the five categories into values. Five categories of satisfaction from very positive to very negative are given values from "2" to "-2". In this way, the final value

close to “2” represents a highly positive assessment, around “0” expresses intermediate satisfaction, and close to “-2” indicates an extreme dissatisfaction.

**Tab. 7.9 Values of satisfaction of respondents towards distance, supply quantity and quality of four most accessible facilities, by location, time of construction, scale and dwelling mode**

Services		Medical facilities			Middle schools			Shopping malls	
		Distance	Ability of physicians	Reliability	Distance	Quantity of faculty	Quality	Distance	Price
Location	Liwan	1.24	0.45	0.44	1.41	0.56	0.59	0.86	0.26
	Haizhu	1.12	0.50	0.49	0.76	0.46	0.27	-0.04	-0.34
	Tianhe	0.39	-0.06	-0.14	0.11	-0.02	-0.07	0.40	0.01
	Baiyun	0.45	-0.09	-0.08	0.71	0.16	0.17	-0.31	-0.21
Time of construction	From 1998	0.82	0.15	0.12	0.67	0.22	0.15	-0.01	-0.15
	2008-2010	0.53	0.07	0.05	1.01	0.35	0.33	0.30	-0.04
	After 2010	-0.07	-0.20	-0.13	-0.72	-0.32	-0.25	-0.48	-0.20
Scale	Big scale	0.41	-0.06	-0.03	0.90	0.28	0.28	-0.13	-0.22
	Medium scale	0.90	0.22	0.15	0.49	0.22	0.11	0.31	-0.04
	Small scale	0.63	0.21	0.16	0.48	0.07	0.08	0.19	0.08
Dwelling mode	Fully mixed	0.82	0.15	0.12	0.67	0.22	0.15	-0.01	-0.15
	Semi mixed	0.39	-0.04	-0.03	0.90	0.32	0.30	0.13	-0.14
	Single	0.54	0.23	0.19	0.09	-0.06	-0.01	0.27	0.15

Note: The data is based on satisfaction evaluation part in survey: questions H20-H40 that focus on their perceptions towards distance and quality of facilities. And each of them have five categories in orderly from “very positive” to “very negative”. To take H20 as an example, category “very near” is valued with “2”; “near” is valued with “1”; “median” is valued with “0”; “far” is valued with “-1” and “very far” is valued with “-2”.

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question H20-H40 (see in Appendices A.2). Surveyed by Chao, R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Medical facilities.** Respondents of communities near the city centre areas (i.e. Dang'en, Fanghe, Guocun in Liwan district, Jude in Haizhu district) indicated overwhelming satisfaction with the distance and service quality of medical facilities. As shown in Tab.7.9, the satisfaction values of Liwan and Haizhu (1.24 and 1.12 respectively) are much higher than the values of Tianhe and Baiyun (0.39 and 0.49 respectively). Respondents of communities near the city centre are very satisfied with the distance, while the satisfaction of those in peripheral areas is weakly positive. A gap also appears in the evaluation of the ability of physicians and reliability of medical facilities. Respondents in Liwan and Haizhu stated weakly positive satisfaction, while interviewees in Tianhe and Baiyun responded with a negative assessment. This may imply that residents' demands regarding the service quality of medical facilities can be basically fulfilled in communities near the city centre, whereas the demands of residents in peripheral communities haven't been met.

Significantly, disparities also exist between respondents in old communities (built from 1998, and built in 2008–2010) and those in new communities built after 2010. Interviewees in new communities displayed much lower and negative values on categories of medical facilities (-0.07, -0.20, and -0.13 respectively). Surveyed residents of new communities built after 2010 are not satisfied with the distance, ability of physicians and reliability (i.e. Guangdan, Anxia and Huize Yaxuan).

**Middle schools.** Respondents in communities near the city centre obviously have higher satisfaction with distance to middle schools and their faculty and educational quality, while respondents in communities in Tianhe district indicated much lower and slightly negative satisfaction. Respondents in Liwan district stated high levels of satisfaction (value is 1.41) with regard to distance to middle schools, and those in Haizhu and Baiyun districts demonstrated average satisfaction (values are 0.76 and 0.71 respectively). However, the satisfaction value is only 0.11 in Tianhe district, which means interviewees in communities there were not very satisfied and thought that the distance to middle schools was

not very near. The assessment of quantity of faculty and educational quality has higher values in Liwan (0.56 and 0.59) and Haizhu (0.46 and 0.27), and in much lower values in Tianhe district (-0.02 and -0.07).

In addition, respondents in new communities built after 2010 demonstrates negative satisfaction values on middle schools. The values of distance, quantity of faculty and educational quality are -0.72, -0.32 and -0.25 respectively. The large gap in satisfaction reflects that respondents in these communities (Guangdan, Anxia and Huize Yaxuan) are a bit unsatisfied with the service of middle school facilities. They may think that middle schools are not close by and education is very normal.

**Shopping malls.** The respondents in communities located in Baiyun and Haizhu districts and those in communities built after 2010 indicated significantly lower satisfaction with the distance to the shopping malls and prices at malls. Respondents in Liwan represented much higher satisfaction with distance (0.86) and with the price level (0.26) than respondents in communities in other districts. The satisfaction values with the distance reduces to 0.40 for Tianhe, -0.04 for Haizhu, and -0.31 for Baiyun. And the value for price level drops to -0.21 for Baiyun and -0.34 for Haizhu. Notably, respondents in communities in Liwan were satisfied with shopping malls, while interviewees of Baiyun and Haizhu were unsatisfied with the service of shopping mall facility. Nevertheless, the apparently lower and negative values are also displayed in communities built after 2010 (distance: -0.48, price level: -0.20). This means respondents in new communities (Guangdan, Anxia and Huize Yaxuan) have a certain dissatisfaction with the distance to and the price level at their accessible shopping malls.

#### 7.4.2 Justice or injustice in accessing medical facilities, middle schools, shopping malls, parks and metro stations

We summarize the results of the accessibility of and satisfaction with different facilities, to infer whether the distribution of facilities to residents of social housing communities is unjust. Generally speaking, residents of communities located in areas closest to the city centre have easy access to these facilities (medical facilities, middle schools, shopping malls, parks and metro station). Residents can reach enough services in a short time by an easy travel mode and they show greater satisfaction. However, residents of communities in peripheral locations (in district of Tianhe and Baiyun) show certain disadvantages in accessing these facilities, as their travel time is longer or they require a faster travel mode than residents near the city centre. In addition, they also give lower satisfaction.

**Medical facilities.** In accessing medical facilities, social housing residents show no clear disadvantages in terms of travelling to healthcare services, but they may experience injustice in accessing sufficient physicians for basic healthcare. Whether basic healthcare or key hospitals, the analyses indicate that social housing residents do not experience significant difficulties in accessing them (see Chapter 7.2.1.4). Communities are located within a 20 min-walking service area of basic healthcare facilities, and are situated within service areas of 20 min-bus or 20–40 min-bus of key hospitals. Accessing key hospitals requires a faster vehicle or a bit more time owing to locational economics in terms of which higher-level settlement serves a larger market area while lower-level settlement serves a smaller area. Only residents of communities near the city centre demonstrate superior advantages over residents of communities which are peripherally located (in Tianhe and Baiyun) or built after 2010 (Guangdan, Anxia and Huize Yaxuan). At the same time, the survey confirms that respondents are satisfied with the distance to medical facilities, although those in Liwan and Haizhu district responded with greater satisfaction (see Chapter 7.3.4). Therefore, residents of social housing communities experience no injustice in travelling to medical facilities.

However, residents of remote social housing communities confront some injustice-related problems in accessing sufficient services at basic medical facilities. A significant disparity in was revealed in the ratio of available physicians for basic care to the population, which indicates that most residents (except those in communities near the city centre) can reach far fewer physicians for basic healthcare. They also responded with weakly positive satisfaction and even weakly negative satisfaction (respondents of new built communities: Guangdan, Anxia and Huize Yaxuan) on the service of physicians.

To conclude, it is highly likely that social housing residents experience certain injustices in access to available physicians at basic medical facilities. The situation will be far more severe among those in communities in Tianhe and Baiyun districts and communities built after 2010 (Guangdan, Anxia and Huize Yaxuan). Therefore, the results suggest

that basic medical facilities around social housing communities should be improved, especially those surrounding Tianhe and Baiyun districts and new projects. Otherwise, living in social housing communities may result in more injustice problems for residents when accessing healthcare.

**Middle schools.** The results in relation to the service areas of middle schools and travel time of respondents indicate that residents of most surveyed social housing communities (except those built after 2010: Guangdan, Anxia and Huize Yaxuan) do not suffer obvious disadvantages in accessing basic middle schools. Their distance to basic middle schools and travel time are comparable to people in the central area of Guangzhou. At the same time, while residents of communities near the city centre show advantages in accessing key middle schools, other residents, particularly those in peripheral communities, display certain disparities. From the findings on satisfaction, we perceive that respondents in communities near the city centre rated the distance to and quality of middle schools higher, and those in communities in Tianhe district reported significantly lower satisfaction. Respondents in communities in Haizhu and Baiyun indicated average satisfaction, while respondents in new communities built after 2010 (i.e. Guangdan, Anxia and Huize Yaxuan) are unsatisfied with the service of middle schools.

To summarize these results about the accessibility of and satisfaction with middle schools, residents of communities built after 2010 (i.e. Guangdan, Anxia and Huize Yaxuan) and those in uncompleted projects located remotely, are identified as suffering some injustice in regard to middle schools. However, the study found no injustice to exist among residents of other surveyed communities on the periphery (in district Baiyun and Tianhe), despite the fact that they do not enjoy such convenient and high-quality middle schools as communities near the city centre. According to the principle of CPT, upper-level settlements serve larger areas and are more concentrated in higher-level centres. So, accessing key middle schools may take longer travel time or a faster travel mode for residents who are peripherally located than people near the central area.

Therefore, the work of reducing injustices related to access to the middle schools should focus on the specific communities of Guangdan, Anxia and Huize Yaxuan. Meanwhile, middle schools also need to be urgently developed in areas in remotely located communities. Improvements in areas close to these communities would be very helpful for reducing the indicated disadvantages.

**Shopping malls.** We notice that residents of communities in Baiyun district and communities built after 2010 (i.e. Guangdan, Anxia and Huize Yaxuan) show some disadvantages in accessing shopping malls. The areas that neighbour on these communities lack shopping mall services, as residents take a minimum 20-min bus ride to reach these facilities. Certain disadvantages imply that these residents have low accessibility to shopping malls. Thus, improving shopping mall services in these areas (particularly in Baiyun district) would be very helpful for reducing disparities among residents in terms of reaching shopping malls.

**Parks.** The location of Guocun, a community in Baiyun district, and some uncompleted projects in southern Huangpu and middle and northern Baiyun, may result in inconvenient travel for their residents in accessing parks. These communities are located within larger service areas of parks, and more respondents in communities in Baiyun district indicated that longer travel time and faster vehicles were required in accessing parks. Therefore, residents of Guocun and communities in Baiyun district experience disadvantages in reaching parks. Improving park facilities in Baiyun district may greatly increase the accessibility of the residents.

**Metro station.** As identified from the service area and travel data, most residents of social housing communities demonstrate obvious disadvantages in reaching metro stations. Metro lines are concentrated in the central area and only four communities, Fanghe, Guocun and Dang'en (in Liwan district) and Jinshazhou in Baiyun district, are spatially situated near metro stations. Residents of these four communities can easily reach a metro station, but residents of other social housing communities have to go by bus for a minimum of 20 minutes.

## 7.5 Influence of satisfaction with facilities

### 7.5.1 Main factors related to satisfaction with accessibility

From the respondents' data, we have a view of their satisfaction with various facilities. Furthermore, it is also important to identify which facility or what feature of a facility is more crucial for residents' satisfaction. Social housing residents may not expect high accessibility to all facilities but do emphasize specific ones. Hence, we try to identify the main factors that are associated with residents' satisfaction with the services of facilities. In this study, we examined the residents' satisfaction using 20 indicators, which cover various features (e.g. distance, supply and so on) of health services, educational facilities, commercial provision and transport infrastructure around social housing communities (see Tab.7.10). Firstly, we use principal component analysis to compress 20 indicators into fewer dimensions, then conduct regression analysis on these extracted factors to examine their correlation with residents' satisfaction.

**Tab. 7.10 Indicators of accessibility of facilities and eigenvalues, contribution rate and load-value matrix of four principal components**

Indicators	Load-value of main components			
	1	2	3	4
H20 The satisfaction with distance to medical facility "near-far"	<b>0.528</b>	0.107	0.130	0.340
H21 The satisfaction with ability of physicians "comprehensive-simple"	0.245	0.315	0.169	<b>0.772</b>
H22 The satisfaction with reliability of physicians "reliable-unreliable"	0.222	0.265	0.103	<b>0.801</b>
H23 The satisfaction with distance to nursery and elementary school "near-far"	<b>0.573</b>	0.506	0.025	-0.171
H24 The satisfaction with faculty of nursery and elementary school "rich-scarce"	0.221	<b>0.763</b>	0.188	0.161
H25 The satisfaction with educational quality of nursery and elementary school "good-bad"	0.208	<b>0.771</b>	0.159	0.204
H26 The satisfaction with distance to middle school "near-far"	0.352	<b>0.642</b>	-0.131	-0.187
H27 The satisfaction with faculty of middle school "rich-scarce"	0.177	<b>0.837</b>	0.073	0.143
H28 The satisfaction with educational quality "good-bad"	0.141	<b>0.816</b>	0.104	0.169
H29 The satisfaction with distance to market "near-far"	<b>0.781</b>	0.199	0.015	-0.209
H30 The satisfaction with commodity supplying of market "rich-insufficient"	<b>0.627</b>	0.019	0.262	0.220
H31 The satisfaction with selling price of market "cheap-expensive"	0.172	0.059	<b>0.799</b>	0.015
H32 The satisfaction with distance to supermarket "near-far"	<b>0.742</b>	0.149	0.198	-0.117
H33 The satisfaction with commodity supplying of supermarket "rich-insufficient"	<b>0.558</b>	0.090	0.426	0.087
H34 The satisfaction with selling price of supermarket "cheap-expensive"	0.172	0.083	<b>0.843</b>	0.063
H35 The satisfaction with distance to shopping mall "near-far"	0.362	0.121	<b>0.512</b>	0.096
H36 The satisfaction with selling price of shopping mall "cheap-expensive"	0.196	0.124	<b>0.712</b>	0.072
H37 The satisfaction with distance to public transport station "near-far"	<b>0.750</b>	0.076	-0.110	-0.053
H38 The satisfaction with supply of public transport station "abundant-few"	<b>0.702</b>	0.122	0.082	0.238
H39 The satisfaction with operation of transport station "efficient-crowded"	<b>0.595</b>	0.107	0.178	0.386
Eigenvalues of main components	7.034	2.236	1.895	1.341
Contribution rate of main components (%)	22.440	17.671	13.049	9.375
Accumulative contribution rate of main components (%)	22.440	40.111	53.160	62.535

Note: Factor extraction analysis method: principal component analysis. Rotation method: Quartimax with Kaiser Normalization. Because most factor analysis regards an absolute score > 0.4 as the selection criteria, in this research we set absolute load-value > 0.4 as the qualified standard. Source: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question H1-H39 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014

Firstly, we reduce these indicators using the function of "Factor Extraction Analysis" in SPSS, which merges similar factors into one dimension. The results of factor analysis are shown in Tab.7.10. The study has extracted the first four principal components with an eigenvalue of > 1 and has discarded other components with smaller eigenvalues. The accumulative contribution rate of four components is 62.535%, which can be basically explained by the original information for the 20 indicators. The first extracted component has the highest contribution rate, 22.440%, and the

second component reveals a 17.671% contribution rate. To identify the meaning of each main factor, we rotate factors to give high loading values on components. We rotate using Quartimax rotation, and then select factors with absolute loading values over 0.5. As demonstrated in Tab.7.10, we highlight values that are over 0.5 and obtain an ideal matrix. Indicators H20, H23, H29, H30, H32, H33, H37, H38 and H39 display high loading on the first component; indicators H24, H25, H26, H27 and H28 show high loading on the second component; H31, H34, H35 and H36 have high loading on the third component; and H21 and H22 present a close relationship with the fourth component. According to the characteristics of these variables, we name the four main components “Near to daily needed facility”, “High quality of education facility”, “Cheap price of commercial facility” and “High quality of medical facility”.

The equation shows that the coefficient of factor “Near to daily needed facility” is the highest (0.239 41), which indicates that the predominant factor that affects satisfaction with facilities is how far the facility needed every day is. In addition, the high quality of educational facilities and the cheap price level of commercial services also have certain positive effects, while the high quality of health services demonstrates a weakly positive correlation with residents’ satisfaction. That is to say, shorter travel time and easier travel mode to access nursery and elementary schools, health services, convenience markets and primary transport systems may be strongly and positively linked to residents’ satisfaction with facilities. In addition, higher educational quality, cheaper price level of goods and higher quality of healthcare also positively affect residents’ satisfaction with facilities. This study takes the variance contribution rate as the weight of each factor. The strength of these four factors is ranked from high to low. The satisfaction equation for facilities can be written as:

$$\text{Satisfaction on facilities} = 0.239\ 41\ F_1 + 0.174\ 28F_2 + 0.141\ 32\ F_3 + 0.094\ 36\ F_4$$

- F<sub>1</sub>: Near to daily needed facility
- F<sub>2</sub>: High quality of educational facility
- F<sub>3</sub>: Cheap price of commercial facility
- F<sub>4</sub>: High quality of medical facility

**7.5.2 Linear regression on overall satisfaction with facilities**

Our study additionally measured the coefficients of the four main factors to overall satisfaction (H40) using linear regression analysis. The factor “H40 Overall satisfaction with facilities” is defined as the dependent variable and the four extracted components (i.e. Near to daily needed facility, High quality of educational facility, cheap price of commercial facility and High quality of medical facility) are regarded as the independent variables. The results are shown in Tab.7.11, which indicates that the p-values of the t-test of all variables are 0.00, which is less than the 0.05

**Tab. 7.11 Coefficients of the overall satisfaction with four factors**

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	3.538	0.022		160.082	0.000
Near to daily needed facility	0.342	0.022	0.441	15.458	0.000
High quality of educational facility	0.199	0.022	0.257	9.011	0.000
Cheap price of commercial facility	0.220	0.022	0.283	9.925	0.000
High quality of medical facility	0.275	0.022	0.355	12.447	0.000

Note: Dependent variable: “H40 Overall satisfaction with facilities”. Independent variables: “Near to daily needed facility”, “High quality of educational facility”, “Cheap price of commercial facility” and “High quality of medical facility”. Significance level  $\alpha$  is 0.05, two-tailed. Source: Questionnaires in 13 social housing communities of Guangzhou (n = 660). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014

significance level. We can then reject the original hypothesis as those coefficients have no significant differences. That is to say, there is a significant linear relation between the dependent variable and the independent variables. The final linear regression equation is:

$$\text{Overall satisfaction with facilities} = 3.538+ 0.342\ F_1 + 0.199\ F_2 + 0.220\ F_3 + 0.275\ F_4$$

- F<sub>1</sub>: Near to daily needed facility

F<sub>2</sub>: High quality of educational facility

F<sub>3</sub>: Cheap price of commercial facility

F<sub>4</sub>: High quality of medical facility

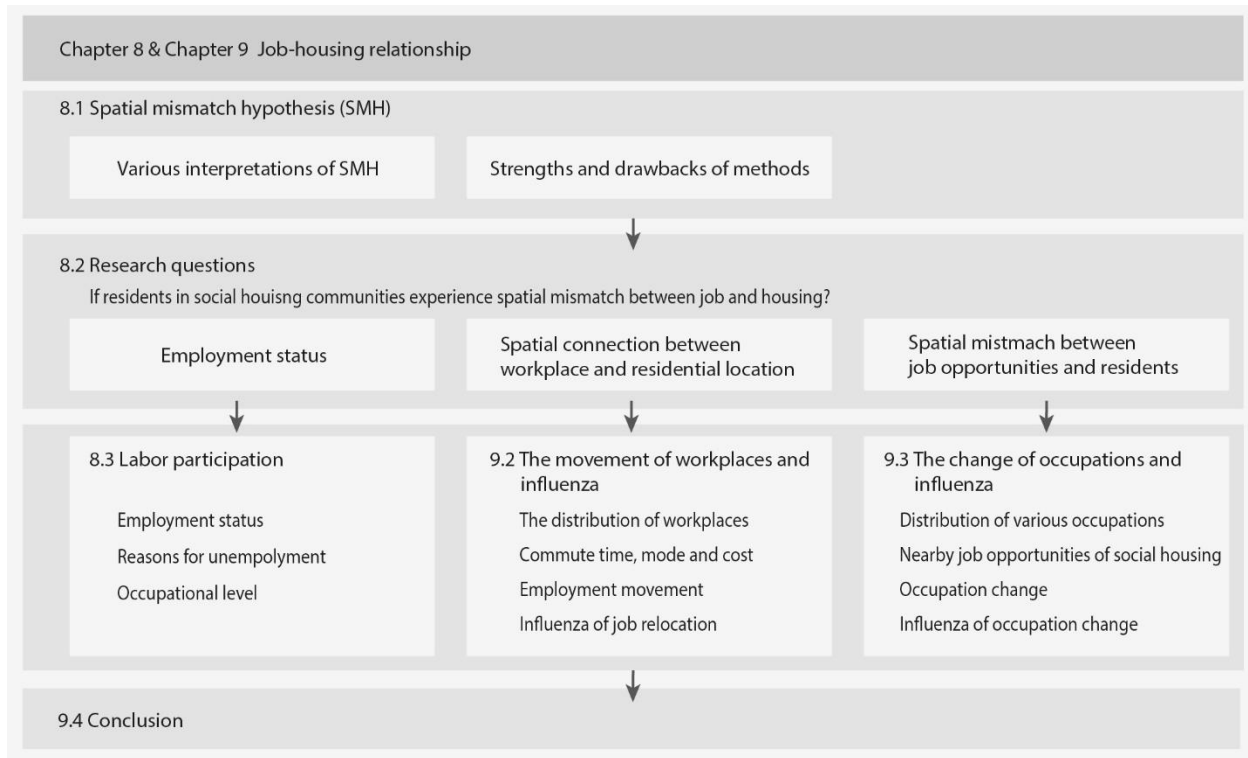
Four factors have positive correlations with the dependent variable. Among the four factors, the F<sub>1</sub> (Near to daily needed facility) demonstrates the highest coefficient (0.342), which indicates the strongest effects on the overall satisfaction. This means the shorter the distance to daily facilities, the higher the satisfaction would be. The influence of F<sub>4</sub> (High quality of medical facility) is second highest (coefficient is 0.275). If the quality of accessible medical facilities improves to some extent, residents may accordingly have higher satisfaction. And factor F<sub>3</sub> (Cheap price of commercial facility) produces the third strength effects (coefficient is 0.220). If the price level at commercial facilities is lower, then residents will be more satisfied with services of facilities. In comparison, factor F<sub>2</sub> has smallest correlation with the dependent variable (coefficient is 0.199). Hence, if the quality of educational facilities were higher residents' satisfaction would also improve. To conclude, residents' satisfaction primarily depends on the level of convenience experienced in reaching the very basic facilities (e.g. nursery and elementary schools, convenience markets, bus stations, basic healthcare and so on). This may indicate that the distance to facilities that are not so essential for everyday life (e.g. parks, key hospitals) may have no significant effects on the satisfaction levels of social housing residents. Nevertheless, residents are also concerned about the quality of healthcare and education and the price level of commercial services.

### 7.5.3 Conclusion

Residents' assessment of the service of facilities greatly depends on the distance to facilities required daily, as well as the quality of basic education, the quality of basic healthcare and the price level of basic commercial goods. Overall, residents of social housing communities are quite near to daily needed facilities (e.g. basic medical facilities, nursery and elementary schools, convenience markets, and public transport station). But most social housing communities, particularly those in Tianhe and Baiyun district, show certain disadvantages in reaching medical facilities, middle schools, shopping malls, parks and metro stations (see Chapter 6 and Chapter 7.2-7.4). The quality of educational facilities and medical facilities and the price level of commercial goods are not much recognized by respondents in these communities. Therefore the achieved outcomes of Chapter 7.4.2 indicate that significant injustice only exists in specific communities in accessing services. For example, the communities in Tianhe and Baiyun district experience certain injustice with regard to the quality of basic medical facilities, and communities in Guangdan, Anxia and Huize Yaxuan show significant disparities in accessing high-quality educational facilities and qualified faculty. To reduce the specific injustices that social housing residents are confronted with, it would be very helpful to strengthen these aspects in order to provide justice services for residents of social housing communities. The prime work in addressing injustice among social housing residents in terms of accessing facilities should focus on the issues of specific communities. In addition, it is also important to improve the quality of basic healthcare services and the quality of education and to address the price level of commercial goods around communities in Tianhe and Baiyun.



## 8 Spatial mismatch hypothesis and the research structure for the job–housing relationship



**Fig. 8.1 Outline of Chapter 8 and Chapter 9: the spatial relationship of job and housing**

Source: own draft, 2017

These two chapters focus on a widely debated topic: the job–housing relationship. This issue refers to the distributive justice of job opportunities. The relationship between workplace and housing is examined in order to find out whether residents of social housing experience difficulties reaching sufficient and suitable job opportunities (see Chapter 2.3.3). The broadly used method for testing the job–housing issue is the spatial mismatch hypothesis (SMH) of John Kain (1968). Many researchers have put forward several interpretations of SMH and have developed corresponding methodologies. To review related studies, the following methods have been adopted to explain the relationship between job and housing: 1) using spatial analysis tools (e.g. ArcGIS) to identify the geographic accessibility of employment; 2) using the unemployment rate or commuting data to demonstrate the accessibility of workplaces; and 3) examining related indices of SMH to respond to the relationship between job and housing. The detailed review is shown in Chapter 8.1, based on which we propose the research structure for this study in section of Chapter 8.2. Our research on the job–housing relationship covers three topics: the employment status of social housing residents (Chapter 8.3), the changes regarding their workplaces after moving into social housing (Chapter 9.1 & 9.2), and the occupational level of residents (Chapter 9.3).

### 8.1 Development of the spatial mismatch hypothesis (SMH)

The SMH can be traced back to the notion postulated by John Kain (1968) in his article “Housing segregation, negro unemployment and metropolitan segregation”. Subsequently, the concept of SMH was formally established and applied to analyse difficulties experienced by the underclasses (e.g. low-skilled minorities) residing in inner cities in accessing suitable job opportunities in the United States during the 1980s (Wilson, 1987; Kasarda, 1989: 26; Gobillon et al, 2007). Many discussions (Orfield, 1997; Galster & Killen, 1995; Galster & Mikelsons, 1995) have explored the possible causes of the spatial mismatch between where the underclass lives and areas with attractive job opportunities: 1) In the process of suburbanization, job opportunities moved away from the city centre where neighbourhoods of underclasses were concentrated, so increasingly blacks living in the central areas lost their jobs or had to make a long commute. 2) Racial

discrimination restricted the employment of black people in job growth areas. 3) Deficient transport connections between the living places of the underclasses and the developing areas with more attractive work opportunities intensified the issue of job–housing mismatch. These studies have elaborated on the influences of suburbanization, racial discrimination and the transport environment. They laid the foundation for the definitions and methods for examining spatial mismatch between residence and workplace.

### 8.1.1 Early investigations of the SMH

#### 8.1.1.1 Focusing on the effects of racial segregation and residential segregation

A very early conceptualization of SMH in the US paid overwhelming attention to the effect of race rather than geographical factors like residential location (Cooke & Shumway, 1991; Arnott, 1998). Since the SMH concept was firstly proposed to explain phenomena relating to black peoples' employment during the decentralization process in the US, it is closely linked to local ethnic segregation issues. The early explanation on spatial mismatch stated that black people remained in the central city while many job opportunities moved to the outskirts because of decentralization. This process resulted in difficulties for and restrictions on blacks in accessing job opportunities. Consequently, high unemployment rates appear among ethnic groups such as blacks. Most of the early investigations addressed racial aspect in identifying the SMH, which led to obvious ignorance regarding the conditions in the separate living locations of blacks and whites. At the same time, the analyses were mainly based on the unemployment rate of ethnic groups.

In his 1968 study on the cities of Detroit and Chicago, Kain explored the interaction between the employment of non-white people and racial segregation. Through regression analysis, he found the strong effects of racial segregation and corresponding housing separation of non-white people to their employment participations and occupations. It also verified that racial segregation has a negative correlation with job opportunities for black people. The perspective and method used by Kain produced significant effects in 1970s and 1980s. Inspired by his discussion, many studies made efforts to identify the existence of the SMH in different regions. Some of them verified that from the SMH existed among black people since they were suffering racial discrimination (Ellwood, 1986; Leonard, 1986; Jencks & Mayer, 1990; Martin, 1997); whereas some did not find that blacks experienced mismatch problems between job and housing (Masters, 1974; Harrison, 1974). Against supporting analysis, Masters (1974) refuted the SMH; his study is based on statistical data on metropolises in the 1960s and displayed positive interactions in four cross-section regressions. These indicated that housing location does not restrict job opportunities for non-white people. However, his outcome was questioned for its biased original data source (Kain, 1992). Harrison (1974) analysed the wage level, unemployment rate and occupational status of residents in a suburban area, a poor central area and the rest of the central area and found that spatial mismatch between job and housing is related more to discrimination in the housing market than to the racial segregation. Owing to differences in grounded data, these analyses have reached varying conclusions. Some of them make use of the unemployment rate to represent the employment status, while others use the wage level. But using either of them as the index for the employment status of a group is not enough to verify the existence of a mismatch between job and housing. The testing of spatial mismatch between job and housing is more complicated, as it is not only an issue of the employment rate or the wage level of the surveyed group, but also relates to other conditions like the convenience of transportation to the employment growth area.

Further, some studies in British cities have added new ideas in investigations. Despite not being a central concern, the spatial condition started to be considered when identifying the SMH (Cheshire, 1979a; Burrige & Gordon, 1981; Gordon, 1987); for example, the measurement on the commuting mobility of low-income households. Researchers have obtained a significant finding that whites living in city centres have the same problems with commuting to workplaces as blacks (Inlanfeldt & Sjoquist, 1989; Inlanfeldt & Sjoquist, 1990). Accordingly, this outcome meant that the SMH can be caused by commuting immobility. It also highlighted that attention should be also paid to the spatial and social features of neighbourhoods and their residents. Fieldhouse (1999) conducted a representative study using logistic regression analysis. The study reveals that a strong link exists between the residential location of minority groups (i.e. black, Indian, Pakistani and Bangladeshi, Chinese and other Asians) and the unemployment rate in London. Additionally, the study indistinctively treated minority ethnic groups as whites, and demonstrated that factors like age and housing type also contributed to the variation in levels of employment discrimination among ethnic groups (Fieldhouse, 1999). At the same time, several studies used regression analysis on wages and features of residential location and verified negative correlations between residential segregation and employment (Jr & Adams, 1996; Price & Mill, 1985; Sexton, 1990).

Nevertheless, the increasing attention paid to residential segregation is also characterized by the implementation of practical projects such as the program “Moving to Opportunity” (MTO) in Chicago. In order to eliminate negative effects from the mismatched connections between residence and job opportunities, MTO was designed to resettle lower-income families in suburban areas and then to observe whether any improvements happened. The outcomes in the following four to seven years did not show any notable effects on their employment statuses, but confirmed that moving into a suburban area with more job opportunities produced some positive effects for the mental and physical health of adults and female youth.

#### **8.1.1.2 Weaknesses and improvements in early interpretations and approaches**

To summarize early studies, many of them defined SMH by using the employment status of the targeted population. However, the mere explanation of employment status or unemployment rate is not sufficient for examining SMH accurately. The critique of this method is that it ignores the many characteristics that may affect people’s employment status and residential location (Ross, 1998: 113). Disregard of the unavoidable influence of these omitted variables in analyses may produce unconvincing results. Consequently, their outcomes may not be able to support an objective and correct SMH. In order to minimize influences from various omitted features (e.g. education, age, family restrictions and so on), several researchers have attempted to improve investigations in three ways: the first one is to restrict the targeted group. In order to avoid influences from residential inertia, many studies only selected the youth as their case study, and some studies even restricted the targeted group to the male youth. They consider male youth to be a group with high homogeneity and large free of family constraints, and they are positive in joining the labour market for job opportunities (Stoll, 1999; Inlanfeldt & Sjoquist, 1989; O’Regan & Quigley, 1991; O’Regan & Quigley, 1996). The second way is to add a step prior to the analysis: to regroup targeted people. Ross (1998) divided survey populations into four categories based on mobility behaviours. With this pre-processing, some potential relations between them would be broken and four types of people can be treated individually. The third way is to do the qualitative analysis based on interview data. For instance, Boschmann (2011) concluded survey results based on the responses of 30 working poor in Columbus, Ohio, and analysed their attitudes and corresponding changes towards the long commute to job, as well as unemployment.

### **8.1.2 Broadening the analysis and interpretation of the SMH**

#### **8.1.2.1 The spatial mismatch based on employment status by gender and occupation**

With continuous improvement and criticism, the concept of the SMH has become more comprehensive and has widened research perspectives. Related studies about the spatial mismatch between job and housing started to consider gender differences and occupation differences.

Many feminist researchers have criticized the inadequate attention paid to gender differences (Wilson, 1987; McLafferty & Preston, 1992). They recognize that women play a crucial role in households with lower income or minority status. Hence, considering gender differences and exploring women’s job participation in studies of SMH may be helpful to find out specific features of participation in jobs by these populations (Corcoran et al. 2000). There are several noticeable findings like labour market segregation by gender and race in New York. Women from ethnic minorities do not find it as easy as white women to access jobs, and men from minorities demonstrate even lower accessibility. At the same time, many outcomes have indicated the strong link between transportation and women’s employment participation, as well as confirming the relationship between the use of automobiles and the employment status of welfare recipients (Ong, 2002; Cervero et al. 2002). Projects for enhancing public transportation have been established in several cities, with the aim of solving the assumed difficulties of minority groups in inner cities to getting to job-rich areas in suburban areas. However, the difficult relations of women to the job-rich areas are more complex than a simple traffic barrier (Blumenberg, 2004: 269). The study showed that the rate of female welfare recipients remained at a high level: 85% in 1997. Such women have a common preference for job opportunities nearby rather than suburban areas. Hence, efforts to improve the traffic connections between the inner city and job-rich areas may play a limited role in improving access to available jobs among female welfare recipients (Blumenberg, 2004: 271-275).

In addition, analyses have also studied occupational differences and demographic differences. Immergluck (1998: 10-20) used a two-stage least squares regression analysis within a small residential zone, and the results indicated the significant and positive effects of proximate jobs creation (especially for low and moderately skilled jobs) on employment participation. Similar results can be found in investigations of differences in job participation and access to workplaces

of women by race and ethnicity (Johnston, 1996), of commuting differences by occupation and gender (Sang, O’Kelly & Kwan, 2011), and of differences in employment status and occupation by gender (Madden, 1981; Hanson & Pratt, 1991).

### 8.1.2.2 Spatial mismatch based on an analysis of spatial mobility

With regard to the limitations of employment data, many researchers started applying commuting data to the spatial mismatch issue. There are two main methods for conducting an analysis on commuting. One is a quantitative analysis based on mathematical data regarding commute distance, commute time or commute mode, which are commonly collected by questionnaire surveys. Another method is based on the maps of ArcGIS, using certain spatial analysis tools (e.g. spider diagram, network analysis) to demonstrate the links between job–housing locations and to calculate spatial proximity or mobility between residence and workplaces.

**Measuring the commute time and commute mode.** The study by Taylor and Ong (1995) is based on commute distance and commute time. By using linear regression, the study tested the correlations of ethnicity and residential area with two factors (commute distance and commute time) respectively. The people of different ethnicities (i.e. whites, blacks and Hispanic) and people in minority residential areas (i.e. white area, mixed area and minority area) were examined. The outcome rejected the hypothesis of spatial mismatch, and found no evidence to indicate that a decline in job accessibility is the consequence of the decentralization of low-skilled and moderately skilled job opportunities. Similarly, Gillard (1979), Leonard (1987), Inlanfeldt and Sjoquist (1989; 1990) and Hughes and Madden (1991) used the same method to explore spatial mismatch. Recently, the wide use of smartphones has made it easier to collect the travel data of daily commuters. The possibility of applying these abundant individual data guarantees the accuracy of analysis on commuting. A typical application uses method location based services (LBS) to identify the job–housing locations and commuting trip routes of commuters in three typical residential communities in Beijing (Long & Thill, 2015).

However, commuting data of surveyed residents is valid but not enough. Those in the labour force being out of work temporarily are excluded from the survey, even though it would be worthwhile to involve them in a study of SMH. Because the unemployment status of these populations would be the outcome of a spatial mismatch, ignorance of valuable samples could lead to inaccurate conclusions.

**Measuring the accessibility of job opportunities.** From visualized maps of the spatial distribution of job opportunities, we can easily identify the geographical relationship between residence and job areas. Some studies define the SMH as the spatial proximity between job and housing (Boschmann, 2011). However, many researchers disagree with this interpretation, as its assumption that long distances to jobs is a spatial mismatch would be unconvincing (Horner, 2007: 1420). A long commute would be a personal choice that is influenced by existing public transport, family situation and even neighbourhood features (Holzer, 1991; Preston & McLafferty, 1999). Therefore, some other studies identify the SMH using the accessibility of available jobs. The approach of gravity model has been widely adopted in mapping connections between job and housing in ArcGIS, thus providing a possibility for evaluating the accessibility of various job opportunities in every residential location. For example, Hess (2005) measured accessibility to the low-wage job opportunities, and the accessibility values of residential locations are demonstrated in maps by classified levels. In addition, Hu (2015: 37) applied this model in testing the job accessibility of the poor in Los Angeles from 1990 to 2010. The results indicated that the poor in the inner city have better access to jobs than residents in the suburban areas. Matas, Raymond and Roig (2010) also conducted a similar analysis in this way.

Although the analysis of job accessibility using maps has made significant contributions, it still has some drawbacks. Firstly, in ArcGIS, analysing the accessibility value of job opportunities cannot be done using the gravity model (tool: inverse distance decay) along the road system, and measuring travel distance based on the road system (tool: service Area) is unable to consider the magnitude of job locations. This means that simulated job accessibility on maps still hardly reflect a real situation. Secondly, analysis of accessibility normally involves all job locations without considering job vacancies or suitable job opportunities for the targeted group. Ignorance of the expectations of job seekers is the main shortcoming of this approach. Hence, the mismatch between people and suitable job opportunities, and the mismatch between job seekers and job vacancies are excluded by this method.

### 8.1.2.3 Other investigations of the SMH

**Analysis that considers differences between jobs and people.** The analyses summarized above have tested the existence of spatial mismatch in different ways. However, a question remains as to whether the spatial mismatch is the product of huge spatial movement of job opportunities, or the result of other factors like personal choice, family restriction or economic ability. To compensate for a lack of consideration of the characteristics of jobs and people in accessibility analysis, researchers suggested adding another step in which jobs and individual characteristics are identified. Analysis of SMH based on the classified categories of job types and populations may be helpful to find out the reasons for mismatch between available job opportunities and potential employees. For example, people in suburban area demonstrate a higher employment rate but longer distance and higher commuting costs to reach workplaces. Middle-class people would like to pay a slightly higher cost for long commutes to compensate for their preference for living in larger houses in suburban areas (Gobillon et al, 2007, 2408). Houston (2005a) proposed the concept of skill mismatch analysis, which emphasizes individual characteristics like the activities of employment participation, skills and employability. Sjoquist (2001) focused on how social acceptability of blacks is associated with their job–housing spatial mismatch. The results indicated a positive correlation between two factors. It means the low labour participation of blacks of inner city largely depends on their low social acceptance.

**Analysis considering residential choices.** Further thinking concerned the effects of residential mobility on SMH. Because both housing location and employment are mutually affected decisions rather than the one-way effect of residential location on employment, neither can be ignored (Boschmann, 2011). That is to say, apart from the strong effects of residential location on people’s employment status, improvement in employment may also encourage residents to move to areas in where more opportunities have (Inlanfeldt & Sjoquist, 1990). Therefore, this suggests that the effects of residential place, residential relocation and residential inertia should be considered. However, this may also add to the difficulties in making an explicit analysis. Some studies have pointed out the occurrence of residential relocation may be less when young. Hence, to categorize people and to identify the targeted group would be a way of removing the possible effects of residential choices.

**Analysis based on quantitative methods of index or models.** In addition to the examination of spatial data and survey data, certain other quantitative methods have been involved in defining spatial mismatch. For instance, some studies adopted the idea of index of dissimilarity<sup>13</sup> (based on minority populations and employment opportunities in each tract) to explain the job–housing spatial mismatch (Stoll, 2006: 831; Stoll & Covington, 2012: 2503; Liu & Painter, 2012: 989). High values of the index indicate that the targeted population may experience disadvantages in accessing job opportunities. This situation is described as a spatial imbalance between the population and employment. Wang et al. (2011) used the concept of dissimilarity in exploring development of a job–housing imbalance in Beijing. The achieved result of greatly ascending index value implies an increasing spatial imbalance between employment and population (Wang et al, 2011: 403).

DeRango (2001: 1523) conceptualized the SMH based on commute distance and employment probabilities. The study tried to identify the spatial mismatch using the declining rate of employment probabilities with distance. Below the threshold rate, a slower decline resulted in longer commute times, and this becomes an inverse relationship when above the threshold rate. Furthermore, Bar-El (2006: 395) developed an equilibrium model to explain interregional imbalances between the labour demands and employment. The model involves labour demands, land prices, employment status, commuting, population and public policy measures.

### 8.1.2.4 Sub conclusions

To conclude: these interpretations and approaches used in empirical studies provide several ways to explain the SMH. For instance, residing a long distance from job-rich areas or suitable job opportunities would be identified as a spatial mismatch; as would long commute times or inconvenient transportation to workplace; and a low employment rate and depressed job participation by a group caused by job location or job discrimination. The various interpretations present

<sup>13</sup> The formula of the index of dissimilarity:  $A = \frac{1}{2} \sum_{i=1}^n \left| \frac{b_i}{B} - \frac{e_i}{E} \right|$ , where:  $b_i$  refers to social housing residents of sub district  $i$ ,  $B$  refers to total number of social housing residents of research area,  $e_i$  refers to the employed population in target occupation of sub district  $i$ , and  $E$  refers to total employed population in target occupation of research area (Stoll, 2006: 831; Stoll & Covington, 2012: 2503; Liu & Painter, 2012: 989).

certain difficulties in providing a correct definition of spatial mismatch, as these interpretation possess their own flaws and strengths. Proposing a reliable explanation should depend on the specific purpose of the study and the features of the study area. As past efforts on this issue have shown, we recognize that both employment and the spatial relationship between job and housing are indispensable. If the test draws on the unemployment rate only or on the spatial relationship between job and housing by using geographical tools, biased or incomplete results may happen. Therefore, our study on examining the SMH with regard to social housing residents in Guangzhou will consider both employment and the spatial relationship between job and housing.

### 8.1.3 Methods for examining the SMH

With respect to diverse classifications of spatial mismatch, researchers have correspondingly adjusted their investigation design and measurement. In line with different interpretations of spatial mismatch, empirical studies have adapted several techniques to satisfy the goal. Some studies concentrate on spatial features to define SMH, some focus on socioeconomic features that link with SMH, and some studies even attempt to find the process that occurs between policy operation and SMH outcomes. Correspondingly, different methods have been applied in identifying SMH. The following part will introduce these methods and draw conclusions on their advantages and limitations.

#### 8.1.3.1 Quantitative methods

**Regression analysis.** Regression model is a most-used technique for exploring the determinants of spatial mismatch between job and housing. Recently, independent variables involved in spatial mismatch have covered factors like personal characteristics, traffic connections, residential area and job accessibility and so on. For example, when considering independent variables in investigating the SMH of native-born blacks and immigrant women in Los Angeles (Parks, 2004: 159). This method is able to deal with over twenty variables that are assumed to be related. The use of regression has great advantages in discovering determinants and correlations between factors. The results of regression analysis enable us to make certain valid assumptions to modify the situation (Gao, Mokhtarian & Johnston, 2008: 353). Various equations have been developed to simulate the regression model, including odds regression, log-odds regression linear regression (Stoll, 2005: 708), ordinary least squares (OLS) (Gao, Mokhtarian & Johnston, 2008: 348-350) and two-stage least squares (2SLS) (Stoll & Covington, 2012: 2013-2015; Stoll, 2006: 839-840; Stoll, 1999: 88-90).

**Cross-sectional analyses.** Compared to the multidimensional regression analysis, cross-sectional analysis is suitable for an in-depth discussion of a smaller number of variables. In particular, in the detailed analysis of racial segregation, gender differences and/or commuting problems, cross-sectional analysis may provide us a clear view of the differences between groups.

#### 8.1.3.2 Spatial analysis methods

Spatial analysis is a GIS-based study. Metadata in GIS possess spatial attributes like location, length, area and direction. This strength of the ArcGIS platform makes it possible to measure the spatial relationships between workplace and residential location. Related issues include job accessibility and job proximity. Further, the outcomes of distance, commuting mobility or values will be indicated on maps. The mathematical data on points, lines and areas are mainly collected from a censuses or statistics. For example, data on population, employment rate, occupation level and number of job opportunities can be allocated to the smallest geographical units (like the census tracts of the US and sub-district areas of Chinese cities).

To calculate the accessibility of job opportunities in GIS, the tool of inverse distance decay is widely used to simulate a gravity model (see details in Chapter 7.1.1). The analysis postulates that the place close to the centre receives a higher magnitude of job opportunities, whereas distant locations receive lower weights. There is no doubt that this approach has supported noticeable achievements in analysis of the SMH; however, the gravity model also has intrinsic weaknesses, which are mainly caused by the limitation of metadata. Firstly, job opportunities are not equal in number to vacant job positions, and it is not possible to obtain the occupational level of workplaces from statistics. Then, there is the question of how to define a decay radius that determines the number of included cases. Consequently, the calculated results would be different in a certain area. Several studies have selected levels 5 miles (Stoll, 2006: 829), 3 miles (Hess, 2005: 1189) and 2 miles (Immergluck, 1998: 14). We should be cautious regarding these problems when structuring a correct analysis.

**8.1.3.3 Qualitative methods**

Qualitative methods have some advantages for describing the phenomena overall. As spatial mismatch is an issue linked to certain subjective factors like personal decisions, which are seldom considered by quantitative methods. However, qualitative methods can avoid this drawback by analysing the information from interviews. Nevertheless, qualitative analysis is greatly influenced by linguistic expression, and also has a restriction on case numbers. Only a handful of studies in past decades have been built on qualitative analysis (Boschmann, 2011).

**8.1.3.4 A summary of strengths and drawbacks of the methods**

Houston (2005b) has summarized the merits and flaws of various methods (see Tab.8.1), and mentioned that the conflicts during research are caused by systematic flaws in the various testing methods (Houston, 2005b). He reminds us to be cautious when applying different methods. By focusing on the specifics of these methodologies we can to match our analysis to a proper process.

**Tab. 8.1 Weaknesses and strengths of methods for the spatial mismatch hypothesis, according to Houston, 2005:428**

Method	Weaknesses/Pitfalls	Strengths
Analysis of residential segregation	Segregation does not correspond closely with spatial mismatch. Segregation is not necessarily indicative of residential immobility. Spatial scale affects the degree of correspondence with spatial mismatch. Cannot reveal the mechanisms through which space acts as a barrier to employment.	Comprehensive coverage of a metropolitan area. Focus on segregation, which is an important component of the spatial mismatch hypothesis.
Comparison of commuting times	Constrained opportunity (i.e., some people may be restricted to local jobs). Does not always fully control for different groups' propensity to commute. Sample selection bias. Does not always take account of impacts on earnings and housing costs. Inaccurate measurement of the friction of distance (e.g., straight-line distance). Selective migration may be partially employment led. Cannot reveal the mechanisms through which space acts as a barrier to employment.	Comprehensive coverage of a metropolitan area. Focus on commuting, which is an important component of the spatial mismatch hypothesis.
Comparison of earnings	Wages may not respond to all labor demand-and-supply conditions. There are other reasons for suburban employers to pay higher wages. Does not always take account of impacts on commuting and housing costs. Selective migration may be partially employment led. Cannot reveal the mechanisms through which space acts as a barrier to employment.	Comprehensive coverage of a metropolitan area. Earnings are potentially a good indicator of the balance between labor demand and supply if other factors can be controlled for.
Measures of job proximity	Competing labor not always included. Choice of distance-decay function is ambiguous. Jobs, rather than job vacancies, are used to calculate accessibility. Categorization of labor market segments is ambiguous. Inaccurate measurement of the friction of distance (e.g., straight-line distance). Selective migration may be partially employment led. Cannot reveal the mechanisms through which space acts as a barrier to employment.	Comprehensive coverage of a metropolitan area. Conceptually transparent. Directly measures the extent of spatial mismatch.
Spatial experiments	Limited generalizability of results. Some people who leave their jobs may be able to do so because they have alternative employment opportunities available closer to home. The results are sensitive to the economic cycle and the tightness of the local labor market in which a particular firm-relocation study is carried out.	The problem of selective employment-led migration is controlled for. The mechanisms through which space is a barrier to employment can be investigated, particularly commuting and migration. Longitudinal approach allows processes through time to be captured. Qualitative element allows decision-making processes to be analyzed. Largely avoids the problem of multicollinearity by having built-in controls for the characteristics of the workforce. Differences in mode of travel and propensity to commute are automatically controlled for in the experiment.

Source: Houston, S, D. 2005: 428.

**Methods used to examine the SMH of welfare recipients.** Welfare recipients are also a targeted group in spatial mismatch analysis. The examination of the SMH focuses on the underclasses who are minority (e.g. blacks, Hispanics, and Asians) or lower-skilled employees. Welfare recipients with lower income levels are commonly engaged in lower-skilled jobs. Therefore, in exploring the spatial relationship between their jobs and housing, these measurements shed light on our study of the SMH with regard to social housing recipients. Local low-income households in Guangzhou have largely moved into several social housing neighbourhoods, within which the poor live in a high concentration. Based on measurements of SMH, which are helpful to identify the accessibility of jobs or job-rich areas for social housing residents, we would know if they experience any spatial injustice in employment.

To summarize related studies, the most-used methods are regression and spatial analysis of accessibility. Some researchers have explored relationships between residential location and job place using regression models. For instance, Liu and Painter (2012: 992-993) used regression models to test population and employment movements in relation to the factors that may correlate. The results indicate that immigrants experience a severe mismatch with jobs but their residential shift to job-rich areas may decrease this spatial disparity. Some studies have proven a negative correlation between job access and welfare usage rate. Job-rich areas have lower welfare usage rates and job-poor areas have higher ones (Osterman, 1991). This proves that welfare recipients may have inferior job access. In addition,



a study by Ong and Blumenberg (1998) has shown that the employment of welfare recipients tends to be associated with nearby job opportunities. These researchers used linear regression and logistic regression to test the determinants of commute distance and earnings of welfare recipients respectively. The results show that commute distance is negatively associated with job access, which means recipients who live in job-rich areas have greater employment possibilities, whereas those in job-poor areas have lower employment possibilities. At the same time, welfare recipients with a long commute do not receive compensating wages to offset the cost of long commutes (Ong & Blumenberg, 1998: 83-89). Therefore, welfare recipients experience a mismatch to the job-rich area, but they may rely more on job opportunities nearby.

Nevertheless, some studies defined the SMH of welfare recipients according to the accessibility of specific job opportunities. These studies generally used spatial analysis approaches (e.g. gravity model in ArcGIS) with regard to welfare recipients and job opportunities. For instance, Lens (2014) has proved that there is a spatial mismatch among subsidized households and families in public housing owing to the disproportionate match between welfare recipients and limited low-skilled job opportunities.

**Implications for a job–housing relationship analysis in Guangzhou.** The review informed the way of analysing the relationship between job and housing for social housing residents in Guangzhou. The first question is how the spatial mismatch experienced by social housing residents should be defined. Because social housing residents in Guangzhou mainly have populations with lower job skills. Social housing communities on the periphery may have high concentration of people with such skills, resulting a spatial mismatch, which is characterized by long distances or long commutes to job-rich area or to specific job opportunities. Then, it is also important to find the correct methods for testing. Quantitative methods include the index of employment rate or dissimilarity between employment and the population, and spatial analysis method which measures the accessibility value of geographic units. However, these approaches have both advantages and restrictions. In line with the purpose of the study, the choice of suitable methods is an important step in structuring the research. Thirdly, factors that are supposed to be correlated with employment also have to be conceptualized. Based on these aspects, we will elaborate on the research structure, questions and methods for our examination of spatial mismatch among social housing residents in the following part.

## 8.2 The research structure for the spatial relationship of job–housing

### 8.2.1 Defining the SMH of social housing residents in Guangzhou

Based on the experiences and lacunae in reviewed works, this study will interpret the SMH of social housing residents after moving into communities according to three aspects: employment status, accessibility of job opportunities and of their workplaces, and employment movements and job change. 1) To explore employment status and to examine both employed and unemployed respondents, because a spatial mismatch is not only an issue for employees; it is also highly possible associated with a person's unemployed status. Either the low job access or the long distance to the workplace may result in unemployment. Considering employed residents only may lead to a loss of important information. 2) The spatial accessibility of jobs includes two topics: access to job opportunities and access to individual workplaces. As residents of social housing commonly have lower income and lower skilled jobs, their working possibilities and employment would be closely linked to nearby job opportunities or lower skilled jobs. Because of this employment sensitivity of social housing residents, we will display the distribution of various job opportunities on maps in order to identify the spatial distance between residential location and job-rich areas by occupation. In addition, we also analyse the commutes of surveyed residents in reaching their workplaces to know if they have difficulties going to work. 3) To find out the determinants of employment shifts for space and occupation. The movement of the workplace or a change of job by residents after moving into social housing communities may be a reaction to the spatial mismatch between current residential location and workplaces. Hence, using the regression method, we analyse the relationship between employment change and conceptualized factors which are assumed to be correlated. This analysis is helpful in discovering the influence of the employment change on surveyed residents in social housing. In answering the above questions, we will summarize whether the residential location of social housing will cause difficulties in accessing suitable job opportunities, whether the spatial mismatch appears among social housing residents and whether the situation will worsen or improve over time.

### 8.2.2 Research questions, data and methods

This part is focused on the relationship between job and housing of residents in social housing communities in Guangzhou. We use SMH to respond to the study purpose of identifying whether residents experience any economic inequality after moving into social housing. The job–housing relationship includes two aspects: the spatial match or mismatch between job opportunities and residents, and the spatial connection between the current workplace and housing. Detailed research questions are as follows:

#### **Does housing resettlement into social housing communities affect employment rate and employment possibilities?**

We examine the employment rate of surveyed residents in social housing, and separately analyse a group of employed respondents and unemployed respondents. With respect to unemployed respondents, the study will summarize the given reasons to find out whether the non-working status is caused by the change in housing. As to employed respondents, we will further discuss their spatial links between workplaces and housing and their employment changes or choices to identify whether they are influenced by the resettlement.

#### **Are residents in social housing able to access various jobs easily? Are they distant from job-rich areas and suitable job opportunities?**

We make use of the number of the labour force in each sub district by occupation to represent the distribution of job opportunities. As statistical data on job opportunities (e.g. location, number and occupational level) is lacking, it is impossible to examine the spatial dissimilarity of specific jobs and populations across the research area of Guangzhou. The sixth census in Guangzhou provides us with labour force numbers by occupation for each geographic unit (sub district). Although this index is calculated in line with the residential location of individuals rather than the real location of jobs, it still reflects the distribution of various jobs to some extent. By mapping the ratio of the labour force numbers to local population, the study attempts to show the spatial distribution or agglomeration of various job opportunities.

Then, to identify the distribution of suitable opportunities for social housing residents and the employment environment in proximity to social housing communities, our study assumes social housing residents have limited skills, so they show higher employment participation in lower skilled jobs. We have classified the occupations into lower-skilled and higher-skilled jobs: lower skilled occupations include agriculture, farming industries, commercial and residential services, technicians in production, transportation and so on; higher skilled occupations include professional technicians, clerks and managers (see details in Appendices A.6). Through this spatial analysis, we would like to know whether social housing residents are spatially close to suitable job opportunities.

#### **Can social housing residents reach the workplace easily after housing resettlement?**

Commuting data from the survey were selected to respond this question. Frequencies and percentages pertaining to surveyed residents in the categories of commute time, commute mode and commute cost are analysed to indicate whether they can reach their workplaces easily.

#### **How do employed residents assess their connection to the workplace? Did they have a change of employment or choice after the residential relocation? What factors may determine or affect their employments?**

Plentiful studies have tested the factors that lead to spatial mismatch, but less attention has been paid to the perceptions and reactions of residents to a spatial match or mismatch between job and housing. However, social housing recipients are more likely to have intentions or behaviours of employment change (relocation or occupation change) because of limited residential choices, limited spending on transport and unstable job opportunities. These corresponding reactions not only reflect the assessment of residents of spatial connections to job and housing, but also may reduce the spatial mismatch along with the increasing length of residence. Certainly, we omit the possible reaction of residential movement because our targeted group is housing recipients who have “public housing lock” (Lui & Suen, 2011: 18; Hui et al., 2015: 200). The overwhelming benefits of living in social housing, particularly in Guangzhou – a city with high housing prices – may limit their choices on housing relocation to offset a spatial mismatch. Our study focuses on the job relocation and occupational change among surveyed employees in social housing. We attempt to explore the outcomes of employment change on maps and the potential influence through regression analysis.

### 8.3 Labour participation of social housing residents

It has been widely recognized that the urban poor, low-income people and minority subjects have a lower labour force participation rate and lower skill levels (Mooney, 1967: 109). Several reasons may lead to this reduced participation, such as the high commuting costs for these low-wage workers, less education, poor access to transport, housing discrimination, welfare programmes and so on (Kasarda, 1989: 33; Kain, 1992; Holzer, 1991:109; Painter, 2001:4). The residents of social housing in Guangzhou are welfare-housing recipients, who are mainly people with low income. They generally have characteristics such as limited wages, less education and residential segregation, which may negatively affect jobs searches. Therefore, we will firstly examine the unemployment rate and explore possible reasons for unemployment. Then, we also try to find the occupational level of work among respondents in terms the percentages in various occupations. The study is based on survey data obtained from 660 respondents in 13 social housing communities.

#### 8.3.1 Employment status of social housing residents

The numbers of respondents who are in work and those who are not working indicate a low employment rate in social housing communities. In addition, we also identify the working ability of non-working respondents according to their characteristics (e.g. age, illness, physical disability). Registered respondents with retirement status are regarded as retired people. Respondents aged 25 to 60 years, without serious illness and physical disability, are regarded as the able workforce (see Tab.8.2). Using classified statistics on the unemployment rates and reasons for unemployment of these groups, the study attempts to identify the factors that may influence the labour participation of social housing residents.

**Aging of social housing residents is the main cause of the low employment rate.** Percentages of respondents who are work and non-working demonstrate a very low employment rate in social housing communities (see Tab.8.2). The rate of non-working respondents reaches 72.4%, and only 27.6% percent of the 660 respondents are in work currently. The unemployment rates of respondents in the western communities are much higher than the rate of those located in the middle (Haizhu district), the east (Tianhe district) and the north (Baiyun district). Respectively, 84.0%, 95.0% and 95.0% respondents in Fanghe, Dang'en and Guocun are out of work currently. The percentages of unemployed in the rest of the surveyed communities exhibit a slightly lower level. Eight of communities remaining present unemployment rates of around 65%, and in Guangdan and Zede have 80.0% and 80.8% of respondents respectively, are not working. The very high unemployment rate indicated by the surveyed residents may reflect that social housing residents have low labour participation. The retired respondents occupy a substantial percentage of the 660 people surveyed. In total, 35.5% of respondents have retired. This retired rate amounts to nearly half of the unemployment rate of 72.4%. Particularly in the communities of Dang'en, Guangdan and Anxia, retired respondents comprise 80.0%, 70.0% and 70.0% respectively. This survey result on the high ratio of retirement may indicate that a certain proportion of residents in social housing communities is retired. Hence, the aging of residents would be an important reason for low labour participation in social housing.

**Social housing residents may have low positivity regarding labour participation.** The employment of social housing residents has high sensitivity to factors such as long commute, skilled jobs, welfare programmes, and individual or household restraints. For instance, some residents may quit jobs if they shoulder a heavy burden of care in households, while some unemployed residents have difficulty in finding suitable jobs because of a lack of skills. Nevertheless, there is also a possibility that people initially retreat from employment because of welfare benefits. In order to identify unemployment as a positive choice or a passive consequence, we additionally created two categories: "able workforce of working age" and "unemployed able workforce", and then analysed the reasons given for being unemployed despite being part of the able workforce. Able workforce refers to people aged 25–60 years who have basic working ability without physical restraints (e.g. illness, disability). Therefore, elderly retired people, the youth and physically disabled people who lack working ability do not form part of the able workforce in this study. The unemployed able workforce refers non-working men or women who have working ability. The rate of participation in the able workforce may reflect the overall working possibility of social housing residents. The higher the ratio, the stronger the overall working potential would be. In addition, if the unemployed able workforce occupies a high percentage of total respondents and particularly of the able workforce, it may imply that social housing residents have strong barriers (e.g. low initiative, low skills) to job participation.

In general, the survey respondents reflected that the working potential of social housing communities was moderate (56.1% of respondents were able workforce), and nearly half the able workforce was out of work (28.5% of respondents were unemployed). This means that in social housing communities, quite a high percentage (nearly half) of surveyed residents who have working ability are unemployed. This situation is particularly severe among respondents in communities in Fanghe, Dang'en, Guocun, Tangde and Zede. For instance, 20.0% of respondents in Dang'en were part of the able workforce, but 15.0% of them were unemployed. Three-quarters of surveyed residents here were not working even though they had the ability. This may indicate that residents of centrally located communities (in wester cluster: Liwan district, and in middle cluster: Haizhu district) and older communities (e.g. Zede and Tangde) have a higher percentage of able but non-working workforces. Meanwhile, the results on various reasons for not working (see Tab.8.3) indicate that unemployment among able respondents is mainly caused by household restrictions. 19.9% of non-working respondents chose household restrictions as the reason for no job, 8.4% of unemployed respondents thought difficulties in seeking job results in being out of work, and 9.4% of give no clear reason. These survey results about the rate of the unemployed able workforce and reasons for not working imply that social housing residents may have low positivity in regard to labour participation.

**Tab. 8.2 The percentages of surveyed residents (n = 660) in different employment status, and the percentages of able workforces, by community**

	Employment status <sup>a</sup>						Able workforces <sup>c</sup>			
	In work		Non-working		Retired <sup>b</sup>		Able workforces of working age <sup>d</sup>		Unemployed able workforces <sup>e</sup>	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
<b>Western cluster</b>										
Fanghe (n=100)	16	16.0	84	84.0	47	47.0	40	40.0	24	24.0
Dang'en (n=20)	1	5.0	19	95.0	16	80.0	4	20.0	3	15.0
Guocun (n=20)	1	5.0	19	95.0	6	30.0	8	40.0	7	35.0
<b>Middle cluster</b>										
Jude (n=100)	37	37.0	63	63.0	27	27.0	71	71.0	34	34.0
<b>Eastern cluster</b>										
Tangde (n=100)	34	34.0	66	66.0	23	23.0	76	76.0	42	42.0
Guangdan (n=20)	4	20.0	16	80.0	14	70.0	6	30.0	2	10.0
Tai'an (n=20)	7	35.0	13	65.0	6	30.0	12	60.0	5	25.0
Anxia (n=20)	5	25.0	15	75.0	14	70.0	6	30.0	1	5.0
<b>Northern cluster</b>										
Zede (n=99)	19	19.2	80	80.8	34	34.3	49	49.5	30	30.3
Jinshazhou (n=100)	39	39.0	61	61.0	26	26.0	61	61.0	22	22.0
Jide (n=20)	7	35.0	13	65.0	10	50.0	10	50.0	3	15.0
Huize Yaxuan (n=20)	7	35.0	13	65.0	5	25.0	14	70.0	7	35.0
Likang (n=20)	5	23.8	16	76.2	6	28.6	13	61.9	8	38.1
<b>Total (n=660)</b>	<b>182</b>		<b>478</b>		<b>234</b>		<b>370</b>		<b>188</b>	
<b>Average percentage</b>		<b>27.6</b>		<b>72.4</b>		<b>35.5</b>		<b>56.1</b>		<b>28.5</b>

Note: The percentage of all categories (within employment status and able workforces) is the ratio of the number of category to the total number of the community. <sup>a</sup> Employment status counts all respondents (n = 660). <sup>b</sup> "Retired" is a sub category of "Non-working". "Retired" includes respondents who have registered as retired. Some respondents have registered as retired people before reaching the defined retirement age. <sup>c</sup> The category of "Able workforce" includes the men and women who have working ability and are not affected by physical disability or illness, whether employed or out of work. <sup>d</sup> The category "Able workforce of working age" refers to the able workforce of surveyed residents with a working age of 25–60 years old. <sup>e</sup> The "Unemployed able force" is defined as the able workforce of surveyed residents who are out of work.

Source: own draft, 2017. Database: Questionnaires in 13 social housing communities of Guangzhou (n = 660), Question A1 & A2 (see in Appendices A.2). Surveyed by Chao, R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

**Household restrictions mainly influence the employment of female residents, while the requirements of the labour market greatly affect the employment of male residents.** By comparing the percentages of female and male, significant differences appear between them regarding the reasons "household restrictions" and "job is hard to find". 28.4% of non-working female respondents stated that family conditions restricted them from participating in jobs; whereas, only 4.7% of non-working men were being out of work for this reason (see Tab.8.3). This difference may indicate that the employment status of the able women workforce in social housing is more associated with their families. Moreover, a higher percentage of unemployed male respondents (14.5%) thought jobs were hard to find, while only 4.9% of female respondents attributed their unemployment to difficulties in job seeking (see Tab.8.3). That is to say,

the difficulties emanating from the labour market are more influential in job seeking among male respondents in social housing. These difficulties would be caused by the limited choices in the labour market in relation to skill requirements, preference of employers, and small working areas. Hence, the barriers for non-working female residents in job seeking are somewhat different to those for male residents. While household conditions are more influential on the employment of women in social housing, men residents are more sensitive to the conditions in the labour market.

**Tab. 8.3 Reasons for being out of work, from non-working respondents in social housing (n = 478), by gender and educational background**

	Retirement		Illness		Household restrictions		Job is hard to find		Unwilling to work		Other	
	abs.	%	abs.	%			abs.	%	abs.	%	abs.	%
<b>Gender</b>												
Male (n = 172)	85	49.4	30	53.6	8	4.7	25	14.5	3	1.7	21	46.7
Female (n = 306)	149	48.7	26	46.4	87	28.4	15	4.9	5	1.6	24	53.3
<b>Educational background</b>												
No education (n = 12)	8	66.7	0	0.0	1	8.3	1	8.3	0	0.0	2	4.4
Primary school (n = 69)	34	49.3	8	14.3	10	14.5	8	11.6	1	1.4	8	17.8
Middle school (n = 171)	72	42.1	30	53.6	31	18.1	20	11.7	3	1.8	15	33.3
High school (n = 184)	108	58.7	17	30.4	37	20.1	9	4.9	1	0.5	12	26.7
Undergraduate study (n = 41)	11	26.8	1	1.8	16	39.0	2	4.9	3	7.3	8	17.8
Graduate studies and above(n = 1)	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0
<b>Total (n = 478)</b>	<b>234</b>		<b>56</b>		<b>95</b>		<b>40</b>		<b>8</b>		<b>45</b>	
<b>Average percentage</b>		<b>49.0</b>		<b>11.7</b>		<b>19.9</b>		<b>8.4</b>		<b>1.7</b>		<b>9.4</b>

Note: The percentage in each category is the ratio of the number in the category to the total number in the community. Source: own draft, 2017. Data source: 478 Questionnaires (responded “No” in Question A1 Are you employed at present?) in 13 social housing communities of Guangzhou (n = 660), Question A2, I2 & I5 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

**Requirements of the labour market may have stronger impacts on the employment of less educated residents, and unemployment among higher educated residents is caused mainly by household restrictions.** The percentages that indicated the reason “household restrictions” show an ascending trend as the level of educational background increases. The high percentage of respondents with a higher education level indicated that household restrictions were the reason for their unemployment. Only 8.3% of “no education” respondents were out of work because of household restrictions, and 14.5%, 18.1%, 20.1% of unemployed respondents with “primary school”, “middle school”, “high school” education marked this reason respectively. Moreover, the high percentage of 39.0% of non-working respondents with “undergraduate study” thought household limitations resulted in being out of work (see Tab.8.3). This difference indicates that more educated respondents are more affected by household restrictions compared with less educated respondents. The unemployment of more educated residents would tend to be a personal choice in relation to household conditions.

In contrast, the percentages that indicated the reason “job is hard to find” decrease as the level of education increases. A higher percent of less educated respondents (“no education”: 8.3%, “primary school”: 11.6%, and “middle school”: 11.7%) responded jobs were difficult to find. These then percentages fall to 4.9% for “high school” and 4.9% for “undergraduate study”. The results show that difficulties in job seeking are linked to unemployment among less educated respondents. Hence, we may perceive that less educated residents of social housing may feel more pressure from the labour market than those with higher education levels. This pressure from the labour market in job seeking produces stronger negative effects on the employment of less educated residents than on employment of more educated residents.

To conclude, residents of social housing in Guangzhou show low initiative in job participation, with retirement being the dominant cause of the high unemployment rate in social housing communities. Reasons for unemployment among able residents may display differences by gender and educational background. Household restrictions may produce a stronger impact on women’s job participation than on men’s, with more male residents being out of work because of difficulties in seeking jobs in the labour market. Nevertheless, more less educated residents may be out of work because

of difficulties in job seeking. In contrast, unemployment among more educated residents is less affected by this external labour market difficulty and tends to emanate from internal restrictions imposed by own families.

### 8.3.2 Occupational level of social housing residents

This part will discuss the occupational level of social housing residents in terms of the jobs occupied by employed respondents and those who were employed. A total of 423 respondents are included (see Tab.8.4). The surveyed 15 occupations (see Appendices A.2) have been regrouped into six categories, and are defined as lower-skilled occupations and higher-skilled occupations respectively (see details in Appendices A.6). The occupational level not only reflects the range of working possibilities, but also relates to the wage level. If residents of social housing have fewer skills, they will only access low-skilled or lower-wage job opportunities. The high dependence on lower-skilled jobs may further result in some difficulties in job seeking and low positivity regarding labour participation among social housing residents.

**Tab. 8.4 The percentages of respondents (n = 423) in various occupations, by community**

	Lower-skilled jobs						Higher-skilled jobs							
	Persons in agriculture, farming fishing & forestry industries		Commercial personals, resident services and other services providers		Technicians in production, transportation, operatives etc.		Subtotal		Professional technicians		Clerks, managers of state agencies, party organization & enterprises		Subtotal	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
<b>Western cluster (n = 68)</b>	<b>0</b>	<b>0.0</b>	<b>38</b>	<b>55.9</b>	<b>15</b>	<b>22.1</b>	<b>55</b>	<b>80.9</b>	<b>13</b>	<b>19.1</b>	<b>0</b>	<b>0.0</b>	<b>13</b>	<b>19.1</b>
Fanghe (n = 43)	0	0.0	23	53.5	9	20.9	33	76.7	10	23.3	0	0.0	10	23.3
Dang'en (n = 12)	0	0.0	5	41.7	3	25.0	9	75.0	3	25.0	0	0.0	3	25.0
Guocun (n = 13)	0	0.0	10	76.9	3	23.1	13	100.0	0	0.0	0	0.0	0	0.0
<b>Middle cluster (n = 94)</b>	<b>0</b>	<b>0.0</b>	<b>29</b>	<b>30.9</b>	<b>8</b>	<b>8.5</b>	<b>77</b>	<b>81.9</b>	<b>15</b>	<b>16.0</b>	<b>2</b>	<b>2.1</b>	<b>17</b>	<b>18.1</b>
Jude (n = 94)	0	0.0	29	30.9	8	8.5	77	81.9	15	16.0	2	2.1	17	18.1
<b>Eastern cluster (n = 103)</b>	<b>5</b>	<b>4.9</b>	<b>47</b>	<b>45.6</b>	<b>21</b>	<b>20.4</b>	<b>80</b>	<b>77.7</b>	<b>22</b>	<b>21.4</b>	<b>1</b>	<b>1.0</b>	<b>23</b>	<b>22.3</b>
Tangde (n = 71)	5	7.0	29	40.8	16	22.5	53	74.6	17	23.9	1	1.4	18	25.4
Guangdan (n = 7)	0	0.0	3	42.9	1	14.3	6	85.7	1	14.3	0	0.0	1	14.3
Tai'an (n = 13)	0	0.0	6	46.2	3	23.1	11	84.6	2	15.4	0	0.0	2	15.4
Anxia (n = 12)	0	0.0	9	75.0	1	8.3	10	83.3	2	16.7	0	0.0	2	16.7
<b>Northern cluster (n = 158)</b>	<b>2</b>	<b>1.3</b>	<b>81</b>	<b>51.3</b>	<b>26</b>	<b>16.5</b>	<b>122</b>	<b>77.2</b>	<b>29</b>	<b>18.4</b>	<b>7</b>	<b>4.4</b>	<b>36</b>	<b>22.8</b>
Zede (n = 57)	1	1.8	35	61.4	7	12.3	49	86.0	6	10.5	2	3.5	8	14.0
Jinshazhou (n = 71)	1	1.4	31	43.7	16	22.5	55	77.5	12	16.9	4	5.6	16	22.5
Jide (n = 9)	0	0.0	0	0.0	1	11.1	1	11.1	7	77.8	1	11.1	8	88.9
Zhuixixian (n = 12)	0	0.0	8	66.7	1	8.3	9	75.0	3	25.0	0	0.0	3	25.0
Likang (n = 9)	0	0.0	7	77.8	1	11.1	8	88.9	1	11.1	0	0.0	1	11.1
<b>Total (n = 1423)</b>	<b>7</b>		<b>195</b>		<b>70</b>		<b>334</b>		<b>79</b>		<b>10</b>		<b>89</b>	
<b>Average percentage</b>		<b>1.7</b>		<b>46.1</b>		<b>16.5</b>		<b>79.0</b>		<b>18.7</b>		<b>2.4</b>		<b>21.0</b>

Note: The classification of occupation is based on survey question I30, see details in Appendices A.6.

Source: own draft, 2017. Data source: 423 questionnaires (with answers in Question I30 Occupation) in 13 social housing communities of Guangzhou (n = 660), Question I30 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

From the data in Tab.8.4, we notice that an overwhelming percentage of respondents are working in low-skilled occupations (79.0%) rather than in higher-skilled jobs (21.0%). In total, 46.1% of respondents employed in service-providing occupations in basic fields with less requirement for technical skills (e.g. wholesale and retail services, residential services, catering services). Another 16.5% of respondents worked in goods-producing services including transportation, construction, manufacturing etc. As to higher-skilled jobs, 18.7% of respondents were engaged in jobs that are related to professional services, and only 2.4% worked in governmental services. To conclude, large percentages of respondents are working mainly in low-skilled jobs. Hence, the occupational level of social housing residents would be low, and available work opportunities for them may be concentrated in jobs providing basic services.

### 8.3.3 Conclusion

By analysing reasons for unemployment and occupational level, we find that the low employment rate in social housing communities is significantly related to retirement. However, the able workforce in social housing also demonstrates low initiative in job participation. While household restrictions significantly affect female employment, difficulties related to job seeking in the labour market may be more closely linked to unemployment among males. In addition, non-working

residents with less education may be more closely associated with difficulties in job seeking than more educated residents. Reasons for the latter group being out of work lie less with external difficulties in the labour market and are more a personal choice in relation to their own families. In addition, available work opportunities for social housing residents may concentrate significantly on jobs providing basic services with lower skill requirements. The limited working range and demonstrated low positivity regarding job participation may jointly result in the low employment rate among social housing residents.



## 9 Empirical study of the job–housing relationship<sup>14</sup>

### Spatial justice at community level: A survey-based analysis

#### 9.1 An overview on employment relocation and occupational change

By way of distributing subsidy in-kind, low-rent and low-cost dwellings, local administrators try to provide families with housing difficulties with affordable resettlement. From a spatial perspective, the targeted group consists primarily of local low-income residents who have been resettled in several newly built residential neighbourhoods. Therefore, social housing projects not only triggers large-scale population resettlement away from the inner city, but also lead to spatial concentration of economically weak populations on the urban peripheries. The location of subsidy in-kind housing has a profound effect on residents' basic travel behaviours like commuting, so moving into a new residence no doubt breaks the original job–housing connections. In addition, the time, cost or transport connection of the new job–housing relationship may result in potential changes to workplaces or jobs. Jobs also have both geographical attributes (e.g. location) and social attributes (e.g. job content, salary, personal network). In this sense, subsidized housing for residents is not only a dwelling, but an object that indirectly relates to households' economic conditions and social benefits. How do residents manage the relationship between job and housing within this complex context? We will expand our investigation to two dimensions: the spatial change and the occupational change in employment.

##### 9.1.1 Employment change among respondents of the 13 surveyed communities

In order to have an overall view of employment change, our survey investigated changes in job location and occupation. In the survey, employed respondents were required to indicate the changes of jobs that took place after moving into social housing, and those who still had their original jobs were asked to indicate their intentions to make a potential job change. As shown in Tab.9.1, the rate of changes by category (i.e. have changed workplace, intend to change workplace, have changed type of work, and intend to change type of work) are listed by community. Two main features emerged from the data about employment change.

**Aspiration to change workplace is greater than aspiration to change type of work.** There is a clear gap between the rates for workplace change and occupational change. Both the percentage of people who have changed their workplaces and those who intend to, were 10% higher than the rates of occupational change, whether they had happened or were intended. As seen in first row containing overall data, 28.6% of workers surveyed in social housings have changed their workplace after moving into a new settlement, and 27.5% of total workers were eager to make a change in the future. Comparably, the aspiration to change work type is not as strong, which can be illustrated by the lower percentage of workers (17.6%) who had changed the type of work they did and only 19.2% indicated they may start a new work type.

##### **Respondents in communities that have been established longer demonstrate greater intention to change jobs.**

According to responses relating to change of workplace, the rate of respondents who had considered job relocation was around 60% in the communities of Fanghe, Jude, Tangde, Jinshazhou and Jide, that is, 66.6%, 59.4%, 64.7%, 64.1% and 57.2%, respectively (see Tab.9.1). These numbers are largely surpass the results of other communities. Zede, Jude, Tangde and Jide, which represent projects built during the first wave of social housing construction in Guangzhou, were built in 1998. Jinshazhou and Fanghe are two projects that are typical of the new wave of social housing construction officially launched by the local government in 2008. Compared to other communities, these projects have relatively longer development time. The higher percentages in these communities may indicate an increasing trend in terms of changing workplaces with the length of residence. Similarly, though not as significant as a desired of change workplace, respondents' aspirations to change their type of works demonstrate a similar trait, that is, older social housing communities have higher percentages of workers who have changed or intend to change

<sup>14</sup> We explain “job–housing relationship” in this study from two perspectives: the spatial mis/match between job opportunities and residents who live in social housing communities, and the connection between the workplace and the residential location (e.g. distance and commute time).

occupation. Hence, this phenomenon may indicate that after resettlement in social housing, longer residence length may be positively linked to the intention to change workplace and occupation.

**Tab. 9.1 The changes of employed respondents in terms of workplace and occupation after moving in, by community**

Categories of employed respondents Communities	Total employed respondents	Have changed workplace		Intend to change workplace		Have changed occupation		Intend to change occupation	
		abs.	%	abs.	%	abs.	%	abs.	%
<b>Western cluster</b>	<b>18</b>	<b>6</b>	<b>33.3</b>	<b>6</b>	<b>33.3</b>	<b>4</b>	<b>22.2</b>	<b>4</b>	<b>22.2</b>
Fanghe	16	5	31.3	5	31.3	4	25.0	3	18.8
Dang'en	1	0	0.0	0	0.0	0	0.0	0	0.0
Guocun	1	1	100.0	1	100.0	0	0.0	1	100.0
<b>Middle-Southern cluster</b>	<b>37</b>	<b>10</b>	<b>27.0</b>	<b>12</b>	<b>32.4</b>	<b>5</b>	<b>13.5</b>	<b>8</b>	<b>21.6</b>
Jude	37	10	27.0	12	32.4	5	13.5	8	21.6
<b>Eastern cluster</b>	<b>50</b>	<b>16</b>	<b>32.0</b>	<b>11</b>	<b>22.0</b>	<b>9</b>	<b>18.0</b>	<b>10</b>	<b>20.0</b>
Tangde	34	14	41.2	8	23.5	7	20.6	7	20.6
Guangdan	4	0	0.0	1	25.0	0	0.0	1	25.0
Tai'an	7	2	28.6	2	28.6	2	28.6	2	28.6
Anxia	5	0	0.0	0	0.0	0	0.0	0	0.0
<b>Northern cluster</b>	<b>77</b>	<b>20</b>	<b>26.0</b>	<b>21</b>	<b>27.3</b>	<b>14</b>	<b>18.2</b>	<b>13</b>	<b>16.9</b>
Zede	19	3	15.8	5	26.3	3	15.8	4	21.1
Jinshazhou	39	14	35.9	11	28.2	10	25.6	6	15.4
Jide	7	2	28.6	2	28.6	1	14.3	1	14.3
Huize Yaxuan	7	1	14.3	2	28.6	0	0.0	1	14.3
Likang	5	0	0.0	1	20.0	0	0.0	1	20.0
<b>Total</b>	<b>182</b>	<b>52</b>		<b>50</b>		<b>32</b>		<b>35</b>	
<b>Average percentage</b>			<b>28.6</b>		<b>27.5</b>		<b>17.6</b>		<b>19.2</b>

Source: own draft, 2017. Data source: 182 questionnaires (responded “Yes” in Question A1 Are you employed at present) in 13 social housing communities in Guangzhou (n = 660), Question A10, A11, A23 & A27 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

### 9.1.2 Employment change experienced by respondents regarding occupation

**The majority of respondents in social housing communities are employed in basic services.** From the total number of employed respondents in each occupation category (see Tab.9.2), the majority are working in primary commercial sectors. A large number (100 people) of respondents occupy jobs in security, housekeeping, catering, wholesale, maintenance and other basic services. Comparatively, only 11 people participate in technician groups: 39 people are professional technicians, and five and 21 people are clerks and other, respectively. Because so few respondents are working as farmworkers (1 person), construction workers (2 people), craftsmen (0 person) and clerks (5 people), the percentages of these three groups are more reliable for individual situations, but may provide less reference to the general situation. We pay more attention to those occupational categories with over 10 people.

**Social housing respondents in jobs in security, housekeeping, business and full-time professional work display a higher possibility of changing workplaces than those in other occupations.** The column referring to respondents who “have changed workplace” demonstrates different percentages between various occupations. Respondents who engage in one of three basic services (security management, housekeeping and catering services) or in business show noticeably higher percentages (40.0%, 42.9%, 30.4% and 43.8%) than people surveyed in other occupations like wholesale and retail (14.3%), maintenance management (10.0%), other service trades (17.6%) and full-time professional (25.0%). Respondents indicating the four first-mentioned occupations display similar levels of percentages on “people who intend to change workplace”: 26.7%, 21.4%, 17.4% and 25.0%. These percentages may indicate their high level of activities and the high level of possibility with regard to changing workplace compared to others. In addition, there is a noticeable result that respondents in the group “wholesale and retail” and “full-time professional” demonstrate overwhelming percentages on the intention of change workplaces (42.9% and 56.3% respectively). This may imply that social housing workers in these two occupations have a great probability of to relocate their workplaces to more a suitable location.

Tab. 9.2 The changes of employed respondents in terms of workplace and occupation after moving in, by current occupations

Categories of employed respondents Occupation of respondents	Total employed respondents	Have changed workplace		Intend to change workplace		Have changed occupation		Intend to change occupation	
		abs.	%	abs.	%	abs.	%	abs.	%
<b>People in agriculture, farming, fishing &amp; forestry industries</b>	<b>1</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>
farm worker	1	0	0.0	0	0.0	0	0.0	0	0.0%
<b>Commercial persons, resident services and other services providers</b>	<b>100</b>	<b>26</b>	<b>26.0</b>	<b>24</b>	<b>24.0</b>	<b>17</b>	<b>17.0</b>	<b>19</b>	<b>19.0</b>
security management	15	6	40.0	4	26.7	3	20.0	3	20.0
housekeeping	14	6	42.9	3	21.4	2	14.3	3	21.4
catering services	23	7	30.4	4	17.4	5	21.7	3	13.0
wholesale and retail	21	3	14.3	9	42.9	3	14.3	6	28.6
maintained management	10	1	10.0	2	20.0	0	0.0	2	20.0
other service trades (e.g. hairdresser, cosmetics, restaurant waiter, driver etc.)	17	3	17.6	2	11.8	4	23.5	2	11.8
<b>Technicians in production, transportation, operatives etc.</b>	<b>11</b>	<b>4</b>	<b>36.4</b>	<b>3</b>	<b>27.3</b>	<b>1</b>	<b>9.1</b>	<b>3</b>	<b>27.3</b>
factory worker	9	3	33.3	3	33.3	0	0.0	3	33.3
construction worker	2	1	50.0	0	0.0	1	50.0	0	0.0
craftsman	0	0	--	0	--	0	--	0	--
<b>Professional technicians</b>	<b>39</b>	<b>11</b>	<b>28.2</b>	<b>15</b>	<b>38.5</b>	<b>6</b>	<b>15.4</b>	<b>7</b>	<b>17.9</b>
business personnel	16	7	43.8	4	25.0	3	18.8	2	12.5
business management personnel	7	0	0.0	2	28.6	1	14.3	1	14.3
full-time professional (teacher, doctor, etc.)	16	4	25.0	9	56.3	2	12.5	4	25.0
<b>Clerks, managers of state agencies, party organization &amp; enterprises</b>	<b>5</b>	<b>2</b>	<b>40.0</b>	<b>2</b>	<b>40.0</b>	<b>2</b>	<b>40.0</b>	<b>2</b>	<b>40.0</b>
responsible for government and civil servant	5	2	40.0	2	40.0	2	40.0	2	40.0
<b>Other</b>	<b>21</b>	<b>8</b>	<b>38.1</b>	<b>3</b>	<b>14.3</b>	<b>6</b>	<b>28.6</b>	<b>3</b>	<b>14.3</b>
<b>Total</b>	<b>177</b>	<b>51</b>		<b>47</b>		<b>32</b>		<b>34</b>	
<b>Average percentage</b>			<b>28.8</b>		<b>26.6</b>		<b>18.1</b>		<b>19.2</b>

Note: see details of occupational categories in Appendices A.6.

Source: own draft, 2017. Data source: 182 questionnaires (responded "Yes" in Question A1 Are you employed at present) in 13 social housing communities in Guangzhou (n = 660), Question I30, A10, A11, A23 & A27. 182 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

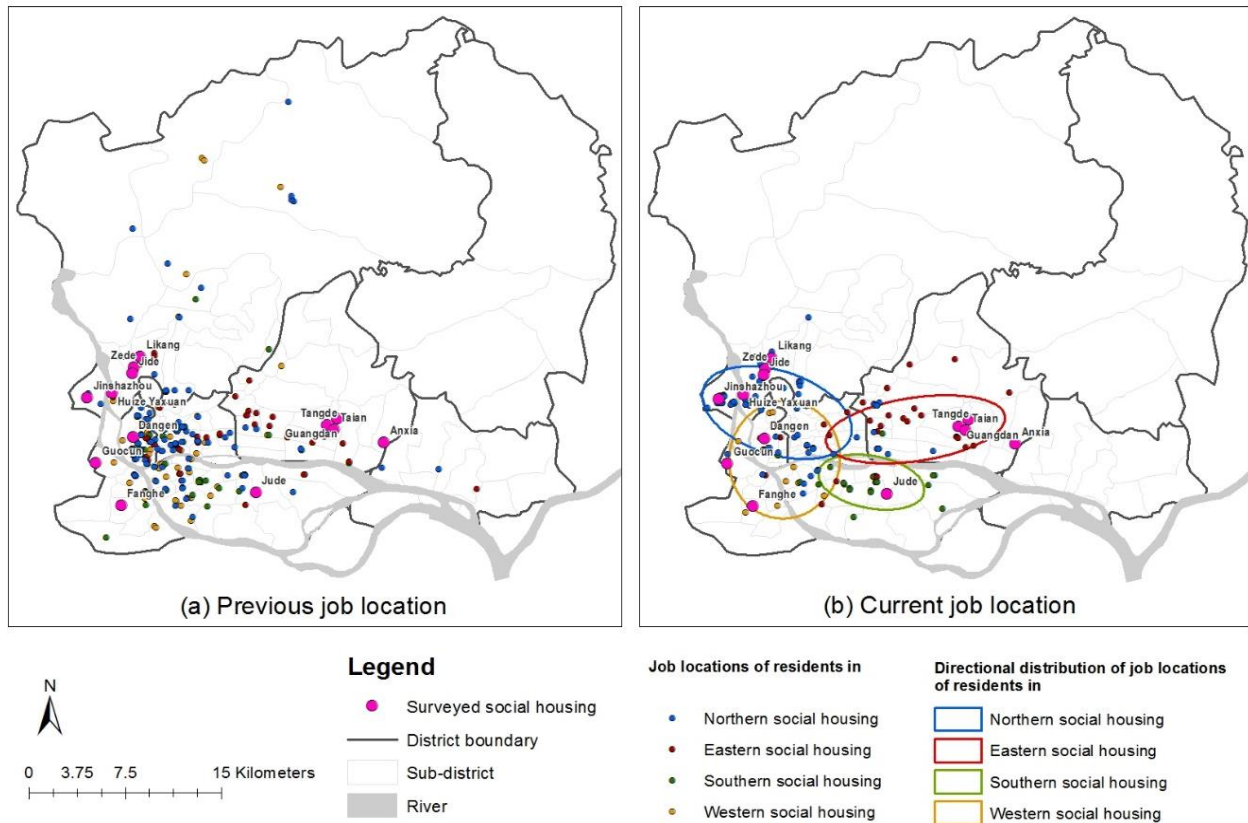
### Respondents' aspirations to change occupation demonstrate no significant difference between occupations.

People who have changed occupation show some differences among groups. People occupying basic services and professional technicians – 17.0% and 15.4%, respectively – have changed their occupations after moving into social housing, and only 9.1% of respondents of the category "technicians in production etc." display this behaviour. However, the ratios of "people who intend to change occupation" of the first two groups are 19.0% and 17.9%, while the last group shows a higher level of 27.3%. Although people employed as "technicians in production, transportation, operatives etc." have a lower percentage of having change occupation, they show a higher percentage in terms of aspiration. Therefore, there would appear to be no significant differences between surveyed residents in these occupations in terms of aspirations to change job type.

## 9.2 The movement of workplace and influence

The above results indicate that a certain number of respondents have changed workplaces after moving into social housing communities. How did these changes of workplace take place and what caused employed respondents to decide to change their original workplaces? The following discussions will respond to these two questions on the basis of the geographical location of their jobs and the commuting data obtained from the survey. The answers pertaining to their workplaces required detail at the street level, hence our study visualized information in ArcGIS and replaced street names with the geographical centre of the street. Although the transformed location not exactly the same as the real workplace, but it still depicts the distribution of workplaces and access route in the study area.

### 9.2.1 The distributions of workplaces by location of communities



**Fig. 9.1 Distribution of workplaces of surveyed residents before and after moving into social housing communities**

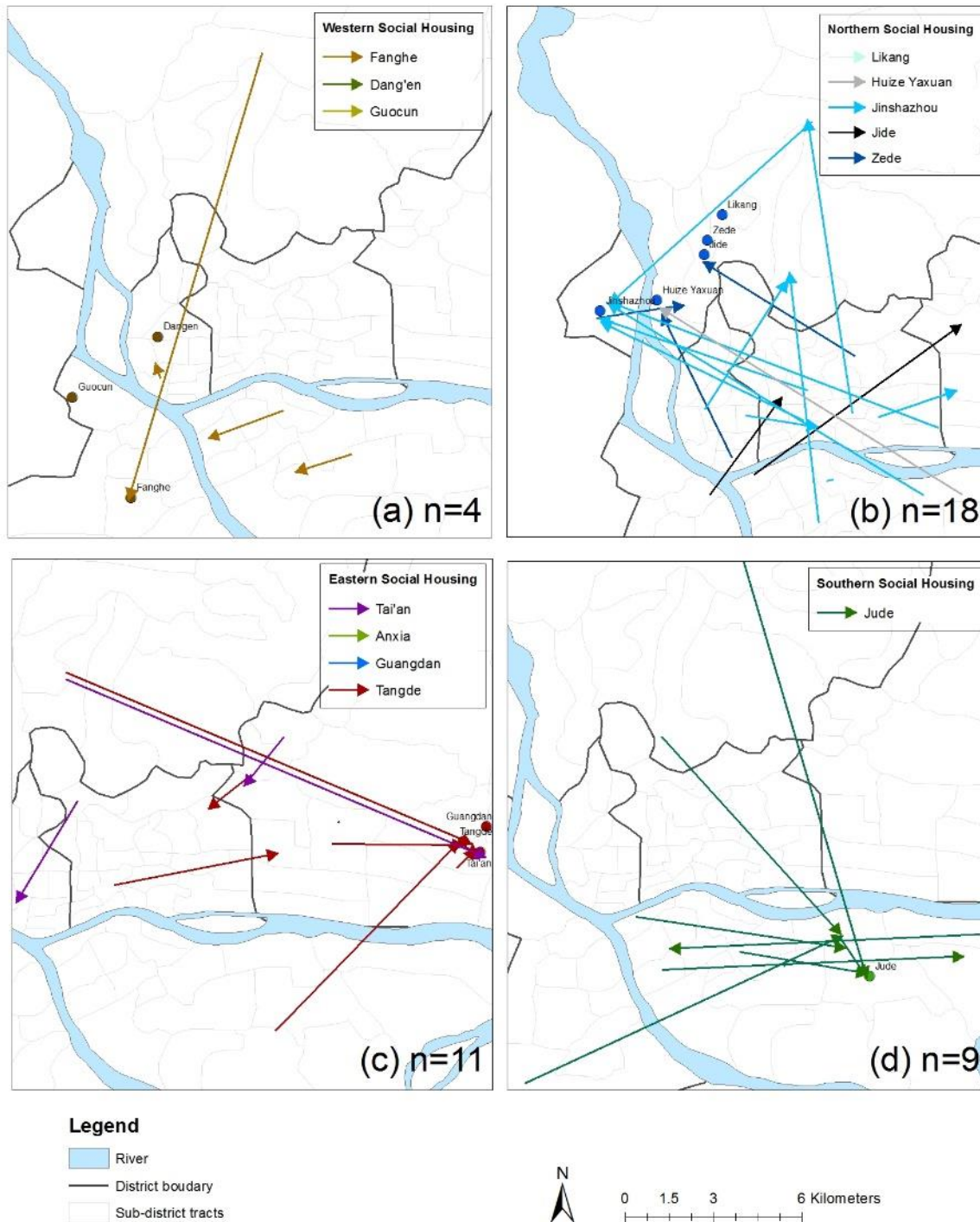
Note: Directional distribution is a statistical analysis tool in ArcGIS, which is also called “standard deviational ellipse”. In terms of x- and y- axes of all included points, it creates an elliptical coordination system for the mean centre. This tool aims to identify the geographic features of spatial dispersion or spread. See details on calculation in URL: <http://desktop.arcgis.com/en/arcmap/latest/tools/spatial-statistics-toolbox/h-how-directional-distribution-standard-deviational.htm> [access on 01.01.2018].

Source: own draft, 2017. Data source: Questionnaires from 13 social housing communities in Guangzhou (n = 660). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

The two pictures in Fig.9.1 visualize the workplaces of respondents before and after moving into social housing – the one on the left is the previous work location while the one on the right is the current work location. Since the locations of the 13 communities demonstrate local proximity (e.g. Zede, Jide and Likang are very close to each other), we classify them into four clusters and identify each with a particular colour to mark the workplaces of their surveyed residents (see Fig.9.1). To compare the two figures, the distribution of all respondents’ previous workplaces are spatially mixed, which mainly concentrate on combined area of Liwan, Yuexiu and Haizhu districts, which is the city’s commercial and administrative centre. In addition, a small number of people are employed in peripheral areas. This distribution paints a typical concentration and dispersion around the city centre in the spatial layout. However, this configuration changed subsequent to moving into the current housing. To obtain an overview, dots are indicated in different colours in terms of their locations. We use the spatial statistical tool “directional distribution” in of ArcGIS to illustrate the distribution of workplaces of the respondents in the same cluster and to search for a spatial trend in current workplaces. Comparing the layouts shown on the left and on the right (see Fig.9.1), we find previous workplaces are highly concentrated around a single hub in the city centre and then scattered in peripheral areas in a declining trend. The more recent distribution demonstrates changes in the central distraction and classified concentration. The previous patterns of intertwined workplaces of respondents in all clusters in the city centre have separated into several areas which are now situated around their residential locations. Respondents residing in Tangde, Guangdan, Tai’an and Anxia are now mostly working in the eastern area: Tianhe district; respondents in Jude are working in areas close to their homes: Haizhu district. A similar phenomenon occurs with respondents in the northern and western clusters. Besides the classified

concentration, we realize that all shapes are directed towards the old city centre and overlap considerably. Therefore, the employment area of people in the eastern cluster which is comparably distant from the old centre presents a long and narrow ellipse to the west, while the pattern pertaining to the western cluster presents an almost perfect circle. Forces related to the economic environment and residential location have stretched the employment space of residents to become a resettlement-centralized and centre-directed area.

The trend of scattered job locations proves the strong link between the location of social housing and job relocation among respondents. The detailed direction of the change in jobs is presented in Fig.9.2. In the figures, the arrows connect the location of the previous job to the location of the current job. To summarise these moves, in the majority cases respondents relocated their jobs from far to near, with obvious residence directivity. Like the westward movements of respondents in Fanghe (see Fig.9.2, a), and the westward and northward movements of respondents in Zede, Jinshazhou and Huize Yaxuan (see Fig.9.2, b), respondents in communities located in the east, Tangde and Tai'an, display an easterly movement (see Fig.9.2, c), and respondents in Jude moved their workplaces towards the east and the south (see Fig.9.2, d). Despite these moves being of different lengths and directions, most of them show a change that is directed towards their residential location. This phenomenon may indicate the positive effects of the residential location of social housing on inhabitants' workplaces.



**Fig. 9.2 The spatial movement of workplace of employed respondents in social housing communities, by clusters**

Note: The map illustrates the spatial movement of the surveyed people who changed their workplaces after moving into social housing communities. Therefore, neither the spatial behaviour of employees with fixed workplaces nor those of the unemployed are displayed here. According to the survey data, only a total 42 respondents had changed their jobs (Western cluster:  $n_{\text{Fanghe}}=4$ ,  $n_{\text{Guocun}} \& n_{\text{Dang'en}}=0$ ; Northern cluster:  $n_{\text{Zede}}=3$ ,  $n_{\text{Jide}}=2$ ,  $n_{\text{Jinshazhou}}=12$ ,  $n_{\text{Huize Yaxuan}}=1$ ,  $n_{\text{Likang}}=0$ ; Eastern cluster:  $n_{\text{Tangde}}=8$ ,  $n_{\text{Tai'an}}=3$ ,  $n_{\text{Anxia}} \& n_{\text{Guangdan}}=0$ ; Middle cluster:  $n_{\text{Jude}}=9$ ) and we show these separately in four groups based on proximate residential locations.

Source: own draft, 2017. Data source: Questionnaires in 13 social housing communities in Guangzhou ( $n = 660$ ). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

### 9.2.2 Changes in commuting behaviour

In explaining spatial justice in terms of the job–housing relationship of residences, an overview of the geographical movement of the workplace would be insufficient. So, our study then focuses on how the job–housing relationship has changed on along the movement in residence. The study attempts to identify the effects of resettlement. As we know that some of the respondents have changed this job location to areas that are close to housing, has this move effectively improved the spatial connection between work and residence or exacerbated it? To explain this, we decided to investigate commuting data that was collected from the surveyed employees in social housing. Commuting data not only directly reflects the spatial connection between work and residence, but also contains individual features, so analysis of commuting data has advantages for describing the real situation pertaining to the job–housing match.

First, we make use of correlation analysis to test the correlation between each pair of variables (i.e. commuting time, commuting mode and commuting cost). We use Pearson’s chi-squared test and set the confidence level at 0.01. In terms of outcomes, neither the expected frequencies for the variables of the previous job–housing match nor of the current job–housing match show significant differences and weak correlations (see Appendices A.8). However, each variable contains some sub categories. T-tests can be used to examine the influence of each category in one variable on the targeted variable. Then, we use the one-way ANOVA method to identify the effects of commuting time on commuting mode, of commuting time on commuting costs, and of commuting mode on commuting costs. The precondition of variance analysis shows insignificant differences among most control variables on the test for homogeneity of variance. Only previous commuting time was found to have significant differences in the groups commuting mode and commuting time (see Appendices A.8). The results indicate that no significant differences exist among these variables. Because the correlation analysis did not show clear significant results between variables, we decided to cross each pair of variables in the tables to search for detailed information. The cross table Tab.9.3 indicates statistics relating to commuting mode and commuting time, and Tab.9.4 states facts regarding commuting time and commuting costs of employed respondents. Simultaneously, the study organizes commuting data by two time periods, previous and current, for comparing differences before and after moving in. The previous period represents the commuting situation before moving into social housing, while the current group shows the recent commuting situation. Based on Tab.9.3 and Tab.9.4, we obtain the following phenomena:

**Increasing number of jobs very close to and far from social housing, and a decreasing rate of employments in medium distance areas.** By comparing the situation of employed respondents before and after moving into social housing, we can see that after resettlement, a higher percentage of respondents spent less time and used an easier travel mode to access workplaces. This implies that an increasing percentage of respondents is working in places either very near to or very far from the place where they are currently living, and a lesser percent is working in area in medium distance from their housing. In the survey, the commuting time was separated into six categories, “<15min” “15-30min” “30-60min” “1-1.5h” “1.5-2h” and “>2h”. Workplaces that commuters can reach within 30 min are defined as near to jobs and “<15min” represents very near to job, the location of the job takes 30–60 min to access which is regarded as being a medium distance job, and a location that requires over 1 hour of commuting time is considered as being far; jobs with commuting times of over 2h means they are very far away.

Looking horizontally in Tab.9.3, certain clear and slight changes appear. One is the increasing rate of very near jobs and the decreasing rate of medium distance job. The percentage of employees who spend less than 15min has increased to 26.9% from the previous 20.4%, while the percentages of group “15-30min” and “30-60min” show a declining trend, respectively, from 34.5% to 30.8% and from 27.8% to 24.2%. At the same time, percentages of commuters in group “<15min” who travel by foot and by bicycle show a slight growth, from 14.4% to 15.9% and from 4.1% to 6.0%. This rising usage of an easy travel mode indicates that commuters are spatially located near their residence. In contrast to this growth is the reduced use on the travel modes “by foot” and “by bicycle” in the medium distance groups “15-30min” and “30-60min”. In particular, two ratios for “walk to job” have shrunk to 1.6% and 0.5% from 5.5% and 1.2%. Duration of workers making a medium commute (30-60min) in the group “by bicycle” has dropped to 1.6% from 6.2%, in contrast to less use of slow vehicles (by bicycle), thus public transportation plays a more important role in commuting among these people. To conclude these findings, the notable opposing changes in very near jobs and near-medium jobs indicate growing employment in areas close to residence and shrinking employment in the near-medium zone. With respect to the ratio of workers with a long commute time (“1-1.5h” and “1.5-2h”), this remains at an



almost equal level, 15.4% (previous) to 15.3% (current). In addition, there is a slight rise, 0.6 percent, in current commuters in group “>2h”. In comparison to the previous commuting structure, several new phenomena emerge after resettlement. Employment in the medium distance region shows a declining trend while very proximate employment demonstrates a growing concentration, and a slightly increased portion of commuters need to take very long time to get to work that is far away.

**Tab. 9.3 Cross table of commuting mode and commuting time**

Travel mode \ Travel time	by foot		by bicycle		by public transport <sup>a</sup>		by electric bicycle		by car		others		Total	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
<b>Previous</b>														
<15min	60	14.4	17	4.1	6	1.4	0	0.0	0	0.0	2	0.5	85	20.4
15-30min	23	5.5	43	10.3	70	16.8	4	1.0	0	0.0	4	1.0	144	34.5
30-60min	5	1.2	26	6.2	81	19.4	1	0.2	2	0.5	1	0.2	116	27.8
1-1.5h	0	0.0	4	1.0	48	11.5	0	0.0	0	0.0	0	0.0	52	12.5
1.5-2h	1	0.2	0	0.0	10	2.4	1	0.2	0	0.0	0	0.0	12	2.9
>2h	1	0.2	0	0.0	7	1.7	0	0.0	0	0.0	0	0.0	8	1.9
<b>Total</b>	<b>90</b>	<b>21.6</b>	<b>90</b>	<b>21.6</b>	<b>222</b>	<b>53.2</b>	<b>6</b>	<b>1.4</b>	<b>2</b>	<b>0.5</b>	<b>7</b>	<b>1.7</b>	<b>417</b>	<b>100.0</b>
<b>Current</b>														
<15min	29	15.9	11	6.0	3	1.6	1	0.5	0	0.0	5	2.7	49	26.9
15-30min	3	1.6	19	10.4	30	16.5	3	1.6	1	0.5	0	0.0	56	30.8
30-60min	1	0.5	3	1.6	39	21.4	0	0.0	1	0.5	0	0.0	44	24.2
1-1.5h	0	0.0	3	1.6	22	12.1	0	0.0	0	0.0	0	0.0	25	13.7
1.5-2h	0	0.0	0	0.0	3	1.6	0	0.0	0	0.0	0	0.0	3	1.6
>2h	0	0.0	0	0.0	4	2.2	0	0.0	1	0.5	0	0.0	5	2.7
<b>Total</b>	<b>33</b>	<b>18.1</b>	<b>36</b>	<b>19.8</b>	<b>101</b>	<b>55.5</b>	<b>4</b>	<b>2.2</b>	<b>3</b>	<b>1.6</b>	<b>5</b>	<b>2.7</b>	<b>182</b>	<b>100.0</b>

Note: <sup>a</sup> Public transport including city bus, metro & company shuttle bus.

Source: own draft, 2017. Data source: 182 questionnaires (respond “Yes” in Question A1 Are you employed at present) in 13 social housing communities in Guangzhou (n = 660), Questions A7 & A8, A20 & A21 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep.2014.

**Rising commuting costs after moving into social housing.** Secondly, we identify changes in commuting costs. Currently, 55.5% of respondents stated that they chose public transport as the commuting mode; 21.4% reached their workplaces within “30-60min” and 12.1% took “1-1.5h” to access (see Tab.9.3). The change in residential location may increase the costs of commuting for many residents. When crossing the commuting cost and the commuting time in Tab.9.4, we find that moving into social housing may lead higher costs of commuting. Except for the declining ratio for the category “< 50yuan”, which means the smallest cost, from 48.2% to 37.4%, the rest of the four groups present a clear increase: from 16.3 to 19.8% in group “50-100yuan”; from 22.5 to 25.8% in group “100-150yuan”; from 8.2 to 8.8% in group “150-200yuan” and from 4.8 to 8.2% in group “>200yuan”.

When focusing on the smallest cost group “<50 yuan”, with attention paid to commuting time, we notice the decreasing percentage is largely attribute to the shrinking weights of groups that use medium commuting time (“15-30min” and “30-60min”). The percentage of category “15-30min” has dropped from 18.0 to 12.1%, and the percentage of category “30-60min” has fell from 8.9 to 0.5%. Similarly, the percentage of category “1-1.5h” is down to 1.6% and “1.5-2h” is down to 0%. Meanwhile, weights of surveyed commuters who use medium commuting time present a higher level of commuting costs than before. The ratio of commuters who pay “50-100yuan” has increased by 2.1% from 5.0% in the group “30-60min”, and by 2.2% from 2.2% in group “1-1.5h”. Similarly, the people surveyed who pay “100-150 yuan” have added 1.3% and 2.8% to their costs in the medium and long commuting time groups (i.e. 30-60min, 1-1.5h); and people in the group “150-200 yuan” have added 1.9% in “15-30min” accessible jobs and 1.8% in “30-60min” accessible jobs; similarly, the costs of people surveyed who use “>200 yuan” per month in both groups (“1.5-2h” and “>2h”, long commuting time) have increased by 1.1%. A reduced percentage of surveyed people use medium commuting time (i.e. 15-30min, 30-60min) and their general rising costs may support results that show decreasing employment in the medium-distant region. Moreover, the percentage of people who pay the least (<50yuan) and commute the shortest distance (<15min) has risen from 18.2 to 22.5%, which supports the increased concentration of employment in areas close to home.

Tab. 9.4 Cross table of commuting time and commuting cost

Travel time Travel Cost (yuan/ month)	<15min		15-30min		30-60min		1-1.5h		1.5-2h		>2h		Total	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
<b>Previous</b>														
<50	76	18.2	75	18.0	37	8.9	9	2.2	2	0.5	2	0.5	201	48.2
50-100	6	1.4	28	6.7	21	5.0	9	2.2	3	0.7	1	0.2	68	16.3
100-150	1	0.2	33	7.9	36	8.6	18	4.3	4	1.0	2	0.5	94	22.5
150-200	0	0.0	6	1.4	13	3.1	11	2.6	3	0.7	1	0.2	34	8.2
>200	2	0.5	2	0.5	9	2.2	5	1.2	0	0.0	2	0.5	20	4.8
<b>Total</b>	<b>85</b>	<b>20.4</b>	<b>144</b>	<b>34.5</b>	<b>116</b>	<b>27.8</b>	<b>52</b>	<b>12.5</b>	<b>12</b>	<b>2.9</b>	<b>8</b>	<b>1.9</b>	<b>417</b>	<b>100.0</b>
<b>Current</b>														
<50	41	22.5	22	12.1	1	0.5	3	1.6	0	0.0	1	0.5	68	37.4
50-100	5	2.7	10	5.5	13	7.1	8	4.4	0	0.0	0	0.0	36	19.8
100-150	2	1.1	13	7.1	18	9.9	13	7.1	1	0.5	0	0.0	47	25.8
150-200	0	0.0	6	3.3	9	4.9	0	0.0	0	0.0	1	0.5	16	8.8
>200	1	0.5	5	2.7	3	1.6	1	0.5	2	1.1	3	1.6	15	8.2
<b>Total</b>	<b>49</b>	<b>26.9</b>	<b>56</b>	<b>30.8</b>	<b>44</b>	<b>24.2</b>	<b>25</b>	<b>13.7</b>	<b>3</b>	<b>1.6</b>	<b>5</b>	<b>2.7</b>	<b>182</b>	<b>100.0</b>

Source: own draft, 2017. Data source: 182 questionnaires (respond "Yes" in Question A1 Are you employed at present) in 13 social housing communities in Guangzhou (n = 660), Question A8 & A9, A21 & A22 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

#### Increasing dependence on faster travel modes, particularly by commuters located in remote communities.

Because the 13 communities are located at different distances from the city centre, and locally available traffic services and employment environments also differ, certain differences may result among the commuting behaviours of residents of the 13 communities. Hence, this study displays the commuting modes used by the 13 communities. Tab.9.5 shows the situation before moving into social housing, while Tab.9.6 shows the situation after housing resettlement. Of the 660 respondents, 417 stated that they were employed before moving into social housing (see Tab.9.5), but only 182 are currently still working (see Tab.9.6). This study will focus on the percentages rather the numbers to seek the differences between the two periods. The 13 communities have been basically divided into four groups according to location: communities in the middle and western clusters are more centrally located than communities in the eastern and northern clusters. Most communities in the latter clusters are located on newly developed land parcels situated long distances from the resources in the urban centre (e.g. labour market, commercial facilities).

The bottom row of Tab.9.5 and Tab.9.6, indicates the total percentages of the surveyed commuters using different travel modes. Generally speaking, previously a higher percent of commuters depended on easy travel modes: 21.6% go to work by foot and another 21.6% use bicycles. However, dependence on walking and bicycles demonstrates a declining trend after resettlement, with 18.1% of people walking to work and 19.8% cycling. At the same time, an increasing percentage of people have started to use public transport and faster vehicles (like electric bicycles and cars) after resettlement. 55.5% of surveyed commuters use public transport currently, while previously the percentage is 53.2%. Other modes are rarely used; 2.2% of surveyed commuters currently use electric bicycles compared to the previous 1.4%, 1.6% travel by car compared to 0.5% previously, and 2.7% now use other vehicles compared to 1.7% previously. The changes indicate a growing reliance on faster commuting mode among residents in social housing. However, these changes are slight. The following descriptions will focus on details of each community based on the general data.

Tab. 9.5 Commuting mode of previously employed respondents in 13 social housing communities

	by foot		by bicycle		by public transport <sup>a</sup>		by electric bicycle		by car		others		Total	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
<b>Western cluster</b>	<b>19</b>	<b>17.9</b>	<b>30</b>	<b>28.3</b>	<b>57</b>	<b>53.8</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>106</b>	<b>100.0</b>
Fanghe	13	18.3	21	29.6	37	52.1	0	0.0	0	0.0	0	0.0	71	100.0
Dang'en	2	11.1	2	11.1	14	77.8	0	0.0	0	0.0	0	0.0	18	100.0
Guocun	4	23.5	7	41.2	6	35.3	0	0.0	0	0.0	0	0.0	17	100.0
<b>Middle cluster</b>	<b>17</b>	<b>27.4</b>	<b>12</b>	<b>19.4</b>	<b>32</b>	<b>51.6</b>	<b>1</b>	<b>1.6</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>62</b>	<b>100.0</b>
Jude	17	27.4	12	19.4	32	51.6	1	1.6	0	0.0	0	0.0	62	100.0
<b>Eastern cluster</b>	<b>20</b>	<b>21.5</b>	<b>18</b>	<b>19.4</b>	<b>50</b>	<b>53.8</b>	<b>1</b>	<b>1.1</b>	<b>1</b>	<b>1.1</b>	<b>3</b>	<b>3.2</b>	<b>93</b>	<b>100.0</b>
Tangde	13	23.2	9	16.1	31	55.4	1	1.8	0	0.0	2	3.6	56	100.0
Guangdan	3	27.3	4	36.4	3	27.3	0	0.0	1	9.1	0	0.0	11	100.0
Tai'an	1	8.3	0	0.0	10	83.3	0	0.0	0	0.0	1	8.3	12	100.0
Anxia	3	21.4	5	35.7	6	42.9	0	0.0	0	0.0	0	0.0	14	100.0
<b>Northern cluster</b>	<b>34</b>	<b>21.8</b>	<b>30</b>	<b>19.2</b>	<b>83</b>	<b>53.2</b>	<b>4</b>	<b>2.6</b>	<b>1</b>	<b>0.6</b>	<b>4</b>	<b>2.6</b>	<b>156</b>	<b>100.0</b>
Zede	20	30.8	11	16.9	29	44.6	2	3.1	0	0.0	3	4.6	65	100.0
Jinshazhou	9	16.1	11	19.6	36	64.3	0	0.0	0	0.0	0	0.0	56	100.0
Jide	1	7.7	2	15.4	7	53.8	2	15.4	1	7.7	0	0.0	13	100.0
Huize Yaxuan	2	25.0	1	12.5	5	62.5	0	0.0	0	0.0	0	0.0	8	100.0
Likang	2	14.3	5	35.7	6	42.9	0	0.0	0	0.0	1	7.1	14	100.0
<b>Total</b>	<b>90</b>		<b>90</b>		<b>222</b>		<b>6</b>		<b>2</b>		<b>7</b>		<b>417</b>	<b>100.0</b>
<b>Average percentage</b>		<b>21.6</b>		<b>21.6</b>		<b>53.2</b>		<b>1.4</b>		<b>0.5</b>		<b>1.7</b>		

Note: <sup>a</sup> Public transport including city bus, metro & company shuttle bus.

Source: own draft, 2017. Data source: 417 questionnaires (with answers in Question A18-A19, respondents who had jobs before resettlement in social housing) in 13 social housing communities in Guangzhou (n = 660), Question A20 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

Tab. 9.6 Commuting mode of current employed respondents in 13 social housing communities

	by foot		by bicycle		by public transport		by electric bicycle		by car		other		Total	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
<b>Western cluster</b>	<b>2</b>	<b>11.1</b>	<b>2</b>	<b>11.1</b>	<b>14</b>	<b>77.8</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>18</b>	<b>100.0</b>
Fanghe	2	12.5	2	12.5	12	75.0	0	0.0	0	0.0	0	0.0	16	100.0
Dang'en	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	1	100.0
Guocun	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	1	100.0
<b>Middle cluster</b>	<b>10</b>	<b>27.0</b>	<b>7</b>	<b>18.9</b>	<b>16</b>	<b>43.2</b>	<b>3</b>	<b>8.1</b>	<b>0</b>	<b>0.0</b>	<b>1</b>	<b>2.7</b>	<b>37</b>	<b>100.0</b>
Jude	10	27.0	7	18.9	16	43.2	3	8.1	0	0.0	1	2.7	37	100.0
<b>Eastern cluster</b>	<b>14</b>	<b>28.0</b>	<b>6</b>	<b>12.0</b>	<b>25</b>	<b>50.0</b>	<b>0</b>	<b>0.0</b>	<b>3</b>	<b>6.0</b>	<b>2</b>	<b>4.0</b>	<b>50</b>	<b>100.0</b>
Tangde	13	38.2	5	14.7	12	35.3	0	0.0	2	5.9	2	5.9	34	100.0
Guangdan	0	0.0	0	0.0	4	100.0	0	0.0	0	0.0	0	0.0	4	100.0
Tai'an	1	14.3	1	14.3	4	57.1	0	0.0	1	14.3	0	0.0	7	100.0
Anxia	0	0.0	0	0.0	5	100.0	0	0.0	0	0.0	0	0.0	5	100.0
<b>Northern cluster</b>	<b>7</b>	<b>9.1</b>	<b>21</b>	<b>27.3</b>	<b>46</b>	<b>59.7</b>	<b>1</b>	<b>1.3</b>	<b>0</b>	<b>0.0</b>	<b>2</b>	<b>2.6</b>	<b>77</b>	<b>100.0</b>
Zede	1	5.3	5	26.3	12	63.2	0	0.0	0	0.0	1	5.3	19	100.0
Jinshazhou	4	10.3	12	30.8	22	56.4	0	0.0	0	0.0	1	2.6	39	100.0
Jide	1	14.3	1	14.3	5	71.4	0	0.0	0	0.0	0	0.0	7	100.0
Huize Yaxuan	1	14.3	2	28.6	3	42.9	1	14.3	0	0.0	0	0.0	7	100.0
Likang	0	0.0	1	20.0	4	80.0	0	0.0	0	0.0	0	0.0	5	100.0
<b>Total</b>	<b>33</b>		<b>36</b>		<b>101</b>		<b>4</b>		<b>3</b>		<b>5</b>		<b>182</b>	<b>100.0</b>
<b>Average percentage</b>		<b>18.1</b>		<b>19.8</b>		<b>55.5</b>		<b>2.2</b>		<b>1.6</b>		<b>2.7</b>		

Source: own draft, 2017. Data source: 182 questionnaires (respond "Yes" in Question A1 Are you employed at present) in 13 social housing communities in Guangzhou (n=660), Question A7 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

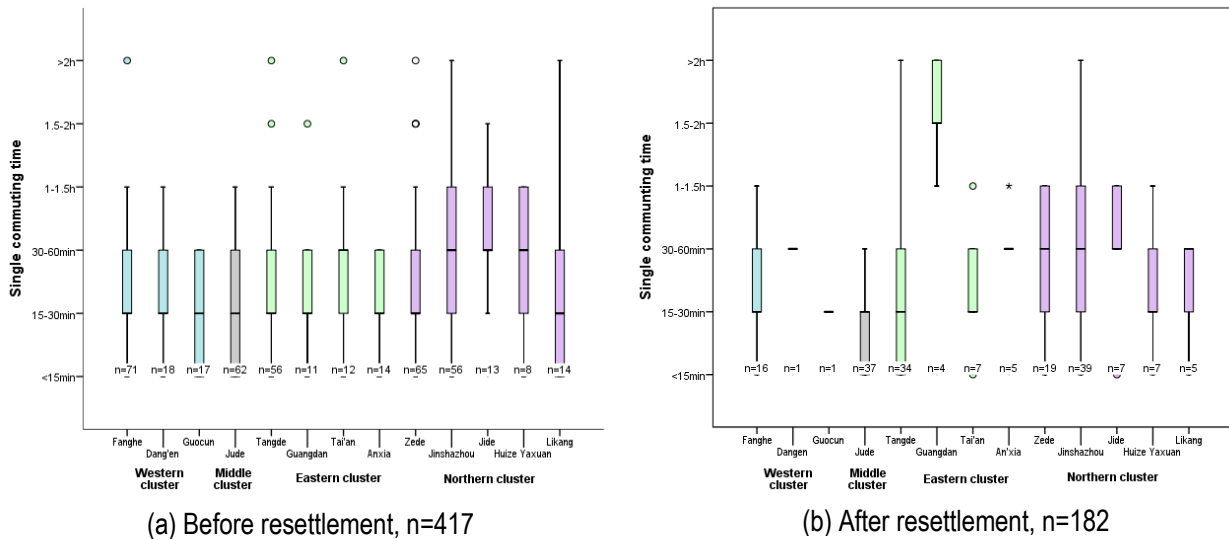
The first change noted is the increasing use of public transport in Fanghe, Dang'en, Guocun, Guangdan, Anxia, Zede, Jide and Likang; this is particularly evident in small-scale communities. For instance, the percentage of the category "by public transport" rises from 77.8 to 100.0% in Dang'en, from 35.3 to 100.0% in Guocun, from 27.3 to 100.0% in Guangdan, from 42.9 to 100.0% in Anxia, from 53.8 to 71.4% in Jide, and from 42.9 to 80.0% in Likang. Furthermore, several large communities like Fanghe and Zede, increased by 21.2% (currently 75.0%, previously 52.1%) and 18.6%

(currently 63.2%, previously 44.6%). In accordance with the increased numbers in the category “by public transport”, the percentages of category “by foot” have shrunk among the above communities. Nevertheless, fluctuations in Jinshazhou and Huize Yaxuan are a bit different. Respondents in Jinshazhou present similar reduced dependence on the category “by foot”, from the previous 16.1% to the current 10.3%; simultaneously, the increasing use of faster vehicles of bicycle (30.8% of people cycle to work currently, and only 19.6% did this previously). Huize Yaxuan’s respondents demonstrate increasing use of bicycles and electric bicycles. To conclude, the sharply increasing dependence on public transport and (electric) bicycles and decreasing dependence on a slow mode – “by foot” – jointly reflect that living in the current location may result in a strong dependence on fast vehicles compared to the previous residential location. However, surveyed commuters in the Jude community indicate no clear changes. There are no notable differences between two time periods in terms of percentages of each travel mode. That is to say, resettlement in the Jude community seems to have rarely affected respondents’ reliance on different commuting mode. Nevertheless, respondents in Tangde and Tai’an communities state increased use of the easiest and slowest travel mode, walking. In contrast to the reduced percentages in the category “by foot” in the other 11 communities, the people surveyed here indicated higher ratios (38.2% and 14.3%) for this mode than previous ratios (23.2% and 8.3%). At the same time, a clear decrease in the category “by public transport” is shown with evidence from the two communities: currently 35.3% and 57.1% people in Tangde and Tai’an choose public transport, which is lower than the previous 55.4% and 83.3%.

To conclude, the commuting mode is linked to the residential location. In general, people surveyed in communities located far from the city centre (i.e. eastern and northern clusters) show increasing use of public transport; in contrast, people in community located close to the centre (like Jude, Tangde, and Tai’an) show increasing use of walking or bicycle, or a stable situation. The facts indicate that moving into a remote social housing community may bring about the increasing dependence of employed people on faster travel means. The increasing using of walking in Tangde implies that the length of residence in social housing may have an effect on commuting behaviours. Tangde is one of the oldest social housing communities in Guangzhou. It is located close to the city centre though not close as Jude. The surrounding areas encompass a well-developed commercial environment and public services. Abundant opportunities may attract residents’ attention to nearby jobs, which may further lead to an increasing rate and greater dependence of residents on slow travel means like “by foot” and “by bicycle”. Nevertheless, people in small-scale communities (e.g. Dang’en, Guocun) seem have greater dependence on public transport than those in larger communities. This difference may be a result of the driving force of the community. A large-scale community with more residents may attracts more attention from markets and administration than a smaller one. These attentions benefit for shaping local labour market, which may further contribute to a shorter commute and greater use of slow vehicles.

**Surveyed commuters in distant and new communities indicate a noticeable increase in commuting time.** We now look at to the commuting time of employed respondents in social housing. Because this analysis only includes employed people who display commuting behaviour, of the total of 660 respondents, 417 were employed before resettlement (see Fig.9.3 (a)) and only 182 currently (see Fig.9.3 (b)). In view of the difference in numbers, this study attempts to explain the median value, value range and concentration in a box plot<sup>15</sup> (see Fig.9.3). In addition, the survey question about commuting time was designed with six ordinal sub categories from “<15min” to “>2h”. The boxplot clearly displays increasing/decreasing travel time along the ascending scale on the y-axis. At the same time, residential communities on the x-axis are separately summarised to include cases. The colour of the box corresponds to the cluster of the community: blue refers to the western cluster, grey is the middle cluster, green represents the eastern cluster and purple marks the northern cluster.

<sup>15</sup> Box plot also named as box-whisker plot, which refers to a descriptive statistical method for indicating the degree of dispersion and skewness of numerical data through quartiles. The plot contains two elements, in which the box depicts data between second and third quartiles and the line represents the middle value of the group. Meanwhile, whiskers extend to both sides of box and shows ranges of first quartile and fourth quartile. In addition, short strokes of top and bottom indicate the highest value and the lowest one respectively. See details about calculation at URL: [https://en.wikipedia.org/wiki/Box\\_plot](https://en.wikipedia.org/wiki/Box_plot) [access on 01.01.2018].



**Fig. 9.3 The time taken to commute on way by in-work respondents in social housing, box plot by communities**

Note: In order to distinguish the communities in the four geographical clusters easily, we have coloured them separately. The numbers marked in the charts present the corresponding code in the questionnaires.

Source: own draft, Oct 2017. Data source: a) 417 questionnaires (with answers in Question A18-A19, respondents who had jobs before resettlement in social housing); b) 182 questionnaires (respond “Yes” in Question A1 Are you employed at present). In 13 social housing communities in Guangzhou (n = 660), Question A21 & A8 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

In general, the surveyed people displayed relatively uniform commuting time before resettlement, but the situation changed after moving into current communities. From the results shown in Fig.9.3 (a), there are no significant differences between the surveyed people in terms of time needed to go to work. The value range of the mid 50% gathers on two scales “15-30min” and “30-60min” (e.g. Fanghe, Dang’en, Tangde, Guangdan Tai’an, Anxia and Zede), and stretches to an even lower scale “<15min” among respondents in Guocun, Jude and Likang. The median value of these communities stays at level “15-30min”. However, this uniform situation changed with the residential relocation. Surveyed people in 13 communities display very different travel time in their commuting behaviours. This difference indicates that the location of social housing definitely changes respondents’ commuting time. With respect to what the effects of location, community size and development time are on commuting time, we investigate by comparing the changes in each community.

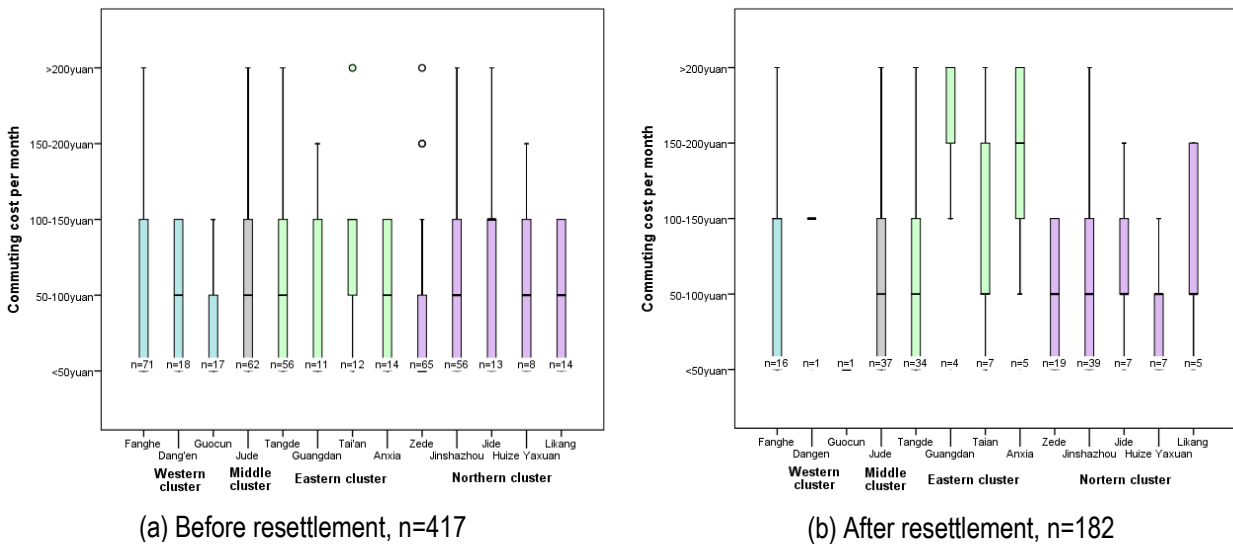
Firstly, we draw on situations in four clusters further focus on the details of each community. Western communities show no significant changes, with the middle 50% of people concentrated between “15-30min” and “30-60min”. Since only one surveyed people each in Dang’en and Guocun are currently employed, comparisons are difficult. However, their middle values “30-60min” and “15-30min” show no significant differences compared to previous commuting time. Workers in Jude show a decreased trend in commuting time. Presently, the majority of respondents (75%) access their workplaces within 30min, which is shorter than the 60min previously indicated. Surveyed people in the eastern cluster demonstrate dramatic changes. The middle value of Tangde reduces to “15-30min” now and a certain number of respondents took a shorter time (less than 30min) to reach their jobs than before resettlement. However, the range has extended up to “>2h” after moving into social housing. This means that, for majority people in Tangde, resettlement has not increased their commuting time. However, for several individuals, the time needed to go to work has greatly increased. People in Guangdan and Anxia demonstrate a huge increase. Currently, all workers in Guangdan take over an hour to go to work and most them are concentrated at the “1.5-2h” and “>2h” levels, which is much longer than before. And respondents of Anxia use “30-60min” to reach workplace. People in Tai’an do not present such striking changes compared to before resettlement. In the northern cluster, commuting time in Zede increases slightly after housing resettlement, but no significant changes happen in Jinshazhou, and time needed by respondents in Jide, Huize Yaxuan and Likang become increased. All surveyed workers in Jide take 30min–1.5h, and most respondents in Huize

Yaxuan currently take 15–60min to commute. In Likang, previously the middle 50% are concentrated in the range of “0–60min”, while currently they are aggregating around 15-60min medium-distance commuting.

To conclude, remote residential locations may cause a large increase in commuting time, particularly in new projects that have been developed more recently. Zede, Jinshazhou, Fanghe, Jude and Tangde are large-scale communities, however, the locations of first two are distant from the city centre. Accordingly, commuting time for the surveyed people in Zede and Jinshazhou is longer than that needed by Jude and Tangde residents. Nevertheless, there are additional effects in the newly built communities in Guangdan and Anxia which display much longer commutes than residents of other communities.

**Commuting costs of respondents in newly built eastern communities increased considerably after resettlement.** Because of the ordinal categories, the survey results on commuting costs are figured in a box plot (see Fig.9.4). The Y-axis depicts five scales from “<50yuan” to “>200yuan” in ascending order, while the x-axis indicates the 13 communities. By comparing Fig.9.4 (a) and in Fig.9.4 (b), the boxes of 13 communities before resettlement concentrate below the scale “100-150yuan”. However, as seen from the uneven boxes in Fig.9.4 (b), this equal situation has damaged after the housing relocation. It means surveyed residents paid a similar amount to commute previously, and but the new social housing location now results in different costs.

In the western and middle clusters, there are no substantial changes in commuting costs between the two periods. 75% of commuters in Fanghe, Jude, Dang'en and Guocun can reach their workplaces with 150 yuan per month. Except for Tangde, the other three communities (Guangdan, Tai'an and Anxia) in the eastern cluster display a huge increase in commuting costs after resettlement, while communities in the northern cluster show a slight increase to different degrees. The middle value of box Zede increases to “50-100yuan”, and the value range of the middle 50% of Jude and Likang have grown to some extent. Jinshazhou presents a stable situation and Huize Yaxuan shows a small decline. To sum up, changes in commuting costs after resettlement are moderate in most communities. Distinct increases have occurred for commuters in the eastern cluster, which is characterized by three new projects, Guangdan, Tai'an and Anxia.



**Fig. 9.4 The monthly commuting costs of employed respondents in social housing, box plot by communities**

Note: In order to distinguish the communities in the four geographical clusters easily, we have coloured them separately. The numbers marked on the charts represent the corresponding code of questionnaires.

Source: own draft, Oct, 2017. Data source: a) 417 questionnaires (with answers in Question A18-A19, respondents who had jobs before resettlement in social housing); b) 182 questionnaires (respond “Yes” in Question A1 Are you employed at present). In 13 social housing communities in Guangzhou (n = 660), Question A22 & A9 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Sub conclusion.** Conclusions drawn from the commuting data illustrate the formation of new commuting structures after moving into social housing. Compared to previous job–housing relationships, the current connection between work and residence is characterized by both an increase in close and far employment, and a decrease in employments in medium-distance zones. Particularly in remote locations and newly built communities, people show a growing dependence on public transport and accordingly indicate increasing commuting times and costs. That is to say, location, residence and time jointly affect commuting behaviours. Living at a distance from the city centre may create certain difficulties for residents when commuting. However, this deficiency may be relieved to some extent with time. Large-scale communities in line with big demands on social services may be helpful for local development and drive the local labour market. Consequently, it may happen that new jobs will be created in areas close to the housing developments. Job–housing mismatch is highly prevalent among residents in new and remote communities. Accordingly, creating new opportunities in areas with social housing is very meaningful for avoiding economic exclusion.

### 9.2.3 Influence of the job relocation

Previous discussions have provided evidence that resettlement in social housing has some effects on the commuting behaviours of the surveyed people. Several respondents found a new workplace because of where they are currently living and accordingly a new job–housing matching relationship was formed. Before evaluating the connection between job and housing matches, it is necessary to be clear that a matching connection not only refers to a short geometrical distance based on the urban traffic system, but also an acceptable distance that meets individual needs. Therefore, exploring this problem has to consider individual feedback. What factors may affect decisions on the job–housing relationship? Whether the new connection meets workers' demands will be discussed in following section.

During the investigation, only employed interviewees were asked to respond to questions about the changes that occurred regarding workplaces or intentions, and then to give reasons. The survey results show that of the 182 employed respondents, 54 people have changed to a new workplace after moving into social housing, 50 people intend to change workplaces in the near future, and the other 78 people have not aspired to change their job location now. Six reasons are given to explain this: distance, traffic, income, employment environment, interpersonal relationships and occupation. Each person was allowed to give three reasons at most. "People who have changed workplace" and "people who intend to change workplace" are regarded as two series in the radar chart in Fig.9.5. Because the different totals of two groups, this analysis standardized selected frequencies for six reasons to show their effective strengths on employment behaviour.

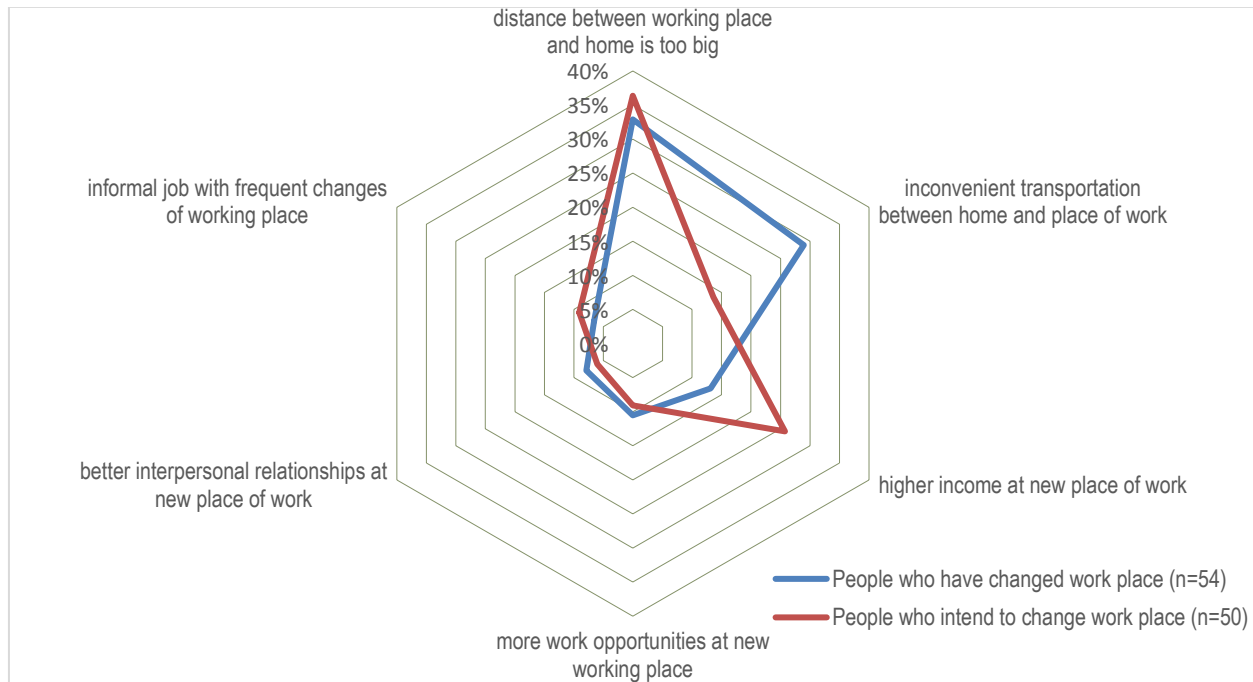
Fig.9.5 shows that the six factors have different effects on the two groups. We indicate the results from four perspectives: 1) the distance to workplace is the strongest factor on workers' decision regarding the workplace. Both people who have changed job location and people with desire to change their workplaces present a high weight on the factor "distance between working place and home" (36.4% and 32.9% respectively). In other words, this factor will have an intense effect on respondents' choice. A long distance between job and house not only exerts a strong influence that leads to job relocation, but may also continue to affect workers' further decisions on their workplace.

2) Transport connection acts as an effective dynamic on job relocation. Regarding this factor, a gap appears between the two groups. People who have relocated workplaces consider that inconvenient transport greatly influences their behaviours, and people who only have change intentions think they are weakly affected by this condition. Selective degree is 28.9% (nearly 30%) among those who have relocated and remains at 13.6% among people with a willingness to relocate, which implies the influence of the factor "inconvenient transport" has a much stronger effect on the first group and leads to a high occurrence of job relocation. The difference between the two groups also proves that transport links are a short-term but strongly effective factor, which may lead people to make changes soon. However, its force will significantly decline with time. For people who consider changing jobs after having been resettled for a while, inconvenient transport no longer creates such a strong effect.

3) Salary is a potential factor that may exert influence in the long term. As we can see from chart, only 13.2% of people have changed jobs by reason of income. Comparing the above two factors, economic conditions seem less related to the spatial decision in the short term. However, the strength of income has risen to 25.7% among people who intend to change jobs, which is similar in degree to the transport factor. Thus, income is a long-term factor for residents, which may contribute to job relocation in the future.



4) Other factors have a limited effect on job relocation behaviour. The limited effect of employment opportunity, interpersonal relationships and occupation can be seen from their small ratios of around 5%. To sum up, distance between work and residence and traffic connections are the two main forces driving residents to change workplace, but the effects from transportation are strong and short-lived, while economic factors may have an increasing influence in future.



**Fig. 9.5 Reasons given for changing workplace after resettlement in social housing**

Source: own draft, Oct, 2017. Data source: 182 questionnaires (respond “Yes” in Question A1 Are you employed at present) in 13 social housing communities in Guangzhou (n=660), Question A12-A14 (see in Appendices A.2). Surveyed by Chao, R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

### 9.2.3.1 Main component analysis of selected variables

Generally, regression analysis can examine around 20 variables and then select significant variables as determinants to explain certain facts. In addition to external effects, the decision to change jobs may also be associated with individual features like gender, education and adjacent environment like dwelling type. Therefore, we conceptualized potential factors on three dimensions: endogenous variables, variables of employment and perceived reasons (see Tab.9.7). The endogenous category contains variables at the levels of individual, household and neighbourhood. The 26 variables listed comprise individual features, family situation and residential environment. The employment category includes five variables about jobs and another three to reflect commuting behaviour. Perceived factors refers to the reasons given by the surveyed people. Each interviewee could indicate reasons according to their own personal situation. These variables regarding individuals or employment may present the effects of the objective conditions, but may fail to indicate effects of subjective factors. Individuals may have different perceptions on certain facts which may result in different work change behaviours, hence, this study asked a number of direct questions in the survey to ascertain whether the factors affected work change. With respect to change of workplace and change of occupation, the survey respectively proposed six reasons (i.e. long commute distance, inconvenient transportation, higher wage level, better work environment, better social network and instinct features of the occupation) and five reasons (higher wage level, better social network, personal interests, instinct features of the occupation and household restrictions) respectively. The first six variables were only applied to studying changes in workplace while the last five variables were only used in analyses about changes in occupation (see Tab. 9.7). These answers are more subjective, as perceptions of a long commute or inconvenient transport connections are not the same as the commonly recognized reality, particularly for some social housing respondents with reduced mobility.

Tab. 9.7 Conceptual model of included variables for regression analyses on job change

Categories	Question code	Title of variable	Details and remarks		
Endogenous variables	Individual level	I2_Re I3	Gender-female Age	'male' = 0; 'female' = 1	
		I5	Educational background	'no education' = 1, 'primary school' = 2, 'middle school' = 3, 'high school or technical secondary school' = 4, 'undergraduate study or junior college' = 5, 'graduate studies and above' = 6, 'other' = 7	
		I24 I25 I26 I27	Pension Health insurance Unemployment insurance work-related injury insurance	'yes' = 1, 'no' = 0 'yes' = 1, 'no' = 0 'yes' = 1, 'no' = 0 'yes' = 1, 'no' = 0	
		I28 I29	Housing fund Hardship subsidies	'yes' = 1, 'no' = 0 'yes' = 1, 'no' = 0	
		I4 I18 I6_Re1 I6_Re2	Marital status Number of family member Number of child Number of elders	'single' = 1, 'married' = 2, 'divorced or widowed' = 3	
		I11 I12_Re2 I14_Re I19	Type of family Household years in residence Ownership Rent	'low-income' = 1, 'low insurance household' = 2, 'poor household' = 3, 'widowed elderly, disabled, veterans' relatives etc. special families' = 4, 'common families' = 5, 'other' = 6 'yes' = 1, 'no' = 0	
		I20_Re I20_Re2	Facing moving-out pressure Facing moving-out pressure caused by exceeded family income	'yes' = 1, 'no' = 0 'yes' = 1, 'no' = 0	
	Household level	I31	Household income (monthly)	'<500' = '1', '500-999' = '2', '1000-1999' = '3', '2000-2999' = '4', '3000-3999' = '5', '4000-4999' = '6', '5000-5999' = '7', '6000-6999' = '8', '>7000' = '9'	
		I32	Household expenses (monthly)	'<500' = '1', '500-999' = '2', '1000-1999' = '3', '2000-2999' = '4', '3000-3999' = '5', '4000-4999' = '6', '5000-5999' = '7', '6000-6999' = '8', '>7000' = '9'	
		Neighbourhood level	City_area1	Inner city location	'yes' = 1, 'no' = 0
			Location_Cluster		'western cluster' = '1', 'middle-southern cluster' = '2', 'eastern cluster' = '3', 'northern cluster' = '4'
			Population	Population of community regrouped according to scale of communities (big, median, small)	'big scale (over 4000 population)' = 1, 'median scale (1500-3000 population)' = 2, 'small scale (less 1500 population)' = 3
			Re_scale		'mix 1: Low-rent, Affordable & ANJU housing' = 1, 'mix 2: Low-rent & Affordable housing' = 2, 'mix 3: Affordable housing' = 3
			Dwellingtype	mixed type	
	Variables of employment	Job	A1 A3	Employment status Employment contract	'yes' = 1, 'no' = 0 'long-term contract' = 1, 'short-term contract' = 2, 'informal work' = 3, 'self-employed' = 4, 'collective business' = 5, 'other' = 6
			A4 A18	The way of job participation Previous employment status	'community announcement' = 1, 'neighbor' introduction' = 2, 'friends' recommendation' = 3, 'by self' = 4, 'with the governments' help' = 5, 'community job fair' = 6, 'other' = 7 'yes' = 1, 'no' = 0
			I30_Re6	Occupation	'basic service trade' = 1, 'secondary industry' = 2, 'commercial business' = 3, 'education sector' = 4, 'administrative sector' = 5, 'other' = 6
			Commuting	A7 A8	Commuting mode Commuting time
		A9		Commute cost	'<50yuan' = 1, '50-100' = 2, '100-150yuan' = 3, '150-200yuan' = 4, '>200yuan' = 5
Perceived reasons		Workplace <sup>a</sup>	A12A24_1 A12A24_2 A12A24_3 A12A24_4 A12A24_5 A12A24_6	Long commute distance Inconvenient transportation For higher wage level For better work environment For better social network Instinct features of the occupation	'yes' = 1, 'no' = 0 'yes' = 1, 'no' = 0 'yes' = 1, 'no' = 0 'yes' = 1, 'no' = 0 'yes' = 1, 'no' = 0 'yes' = 1, 'no' = 0
	Occupation <sup>b</sup>		A15A28_1 A15A28_2 A15A28_34 A15A28_5 A15A28_6	For higher wage level For better social network Personal interests Instinct features of the occupation Household restrictions	'yes' = 1, 'no' = 0 'yes' = 1, 'no' = 0 'yes' = 1, 'no' = 0 'yes' = 1, 'no' = 0 'yes' = 1, 'no' = 0

Note: <sup>a</sup> The six variables included in category “Perceived reasons”/ “Workplace” were used only for tests about changing the workplace (see Tab.9.8- Tab.9.10). <sup>b</sup> The five variables included in the group “perceived reasons”/ “Occupation” applied only in the study of occupational change (see Tab. 9.12- Tab.9.14).

Source: own draft, Oct, 2017. Data source: Questionnaires administered in 13 social housing communities in Guangzhou (n = 660). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

As seen from Tab.9.7, over 40 variables were conceptualized for the following regressions. Over 20 independent variables in one regression may result in very complicated results, and it is hard to avoid the influence of correlated variables. In order to reduce the observed, correlated variables, the study carried out factor analysis to search for a smaller number of unobserved, explainable variables to replace the large number of variables present. Factor analysis,

also called exploratory factor analysis (EFA), is an effective way to reduce the dimensionality of a set of data. Our study selected principal component analysis (PCA), the most used method, to extract the main components based on factor weights. The results of PCA comprise several main elements like load-value matrix, eigenvalues and contribution rate. The load-value matrix functions as the main basis for classifying observed variables and defining latent factors. Factor loadings show the percentage of variance in that observed variables are explained by the extracted factor. Generally, the rule for extracting factors is loadings over 0.7 or higher. The high load-value of the original variable on an underlying factor indicates the priority to be represented. Because the 0.7 standard is high, many researchers use a lower level of 0.4 for exploring. The eigenvalue measures the explanatory importance of extracted factors in all observed variables. A high eigenvalue for a latent factor means a large contribution to the explanation and thus it should be considered. In contrast, a low eigenvalue is of little account for variables and may be ignored. Each new dimension formed may include more than one observed variable with high weights. Then, the extracted items can be renamed with a meaningful label according to the features of variables included.

The PCA in this section regarding job relocation behaviour included all the variables in the endogenous group and the employment group, and the first group 'workplace' of perceived reasons. In this analysis, the extraction principle is to select dimension eigenvalues over 1, and the rotation method is "Varimax". From the results shown in Tab.9.8, we know that 13 extracted factors reach a 73.456% contribution rate. The columns represent the extracted variables and the rows show the observed variables. The loadings over 0.4 have been marked in bold font. The first extracted factor presents very high loadings on most employment-related variables with nearly "1", and the second factor demonstrates high values on some variables related to household economic ability. To check the load values on each factor, we decided to use nine components, factors 1 to 5 and 8 to 11, which have significant weights on some of the original variables. Excluded factors 6 presents -0.662 on "I2\_Re2 household years in residence", 0.556 on "City\_area 1 inner city location" and 0.831 on "Dwellingtype". However, it was very hard to find a common feature among the three variables, which made it difficult to rename the dimension. Because of the moderate loadings on variables, we used the three original variables instead of the extracted factor 6 in the regression analyses. The same reason applies to factor 7; the four observed variables "I3 Age", "I5 educational background", "I4 marital status", "I30\_Re6 occupation" are involved as potential determinants in the following regression analyses to replace the underlying factor. Latent factors 12' and 13 show high loadings on a single variable "I2\_Re gender-female" with 0.772 and "A12A24\_6 instinct features of the occupation" with 0.844 respectively. It is unnecessary to replace the original variable with the new factor with smaller explanatory strength. Nevertheless, since the variable "Location\_Cluster" does not have a weight of more than 0.4 on any factor, it is involved in the regression analysis directly.

To conclude, this study makes use of a total of 18 factors, which comprise nine extracted factors and ten original variables, to being potential determinants of next two logistic regressions on workplace change. In terms of the features of the grouped variables, nine components have been named respectively. Factor 1 is called "employment participation", factor 2 is called "household economic situation", factor 3 is called "insurance of employment", factor 4 is called "size of community", factor 5 is called s "family size", factor 8 is called "moving-out pressure", factor 9 is called s "living security", factor 10 is called "inconvenient spatial connection between job and housing" and factor 11 is called "for better working experience". In addition, ten original variables, "I2\_Re2 gender-female", "I3 age", "I5 educational background", "I4 marital status", "I12\_Re2 household years in residence", "City\_area1 inner city location", "location\_cluster", "Dwellingtype", "I30 occupation" and "A12A24\_6 Instinct features of the occupation", enter regression as potential determinants as well.

Tab. 9.8 Indicators of job relocation and eigenvalue, contribution rate and load-value matrix of extracted principle components

Indicators	Load-value of main components												
	1	2	3	4	5	6	7	8	9	10	11	12	13
I2_Re Gender-female	0.126	0.075	-0.021	-0.120	0.099	0.006	0.030	0.050	-0.101	-0.004	0.049	<b>0.772</b>	-0.109
I3 Age	0.366	-0.072	-0.172	-0.111	0.157	0.091	<b>0.548</b>	-0.131	0.122	-0.090	-0.031	-0.487	-0.048
I5 Educational background	-0.158	0.361	0.239	-0.082	-0.115	0.082	<b>-0.463</b>	0.195	0.040	0.180	0.064	0.247	0.017
I24 Pension	-0.009	0.203	0.167	-0.047	0.074	0.052	0.116	-0.067	<b>0.745</b>	0.024	0.061	-0.019	-0.067
I25 Health insurance	0.000	0.218	0.198	0.024	-0.015	0.003	-0.134	0.078	<b>0.661</b>	-0.004	0.071	-0.182	-0.011
I26 Unemployment insurance	-0.122	0.096	<b>0.842</b>	-0.032	0.022	0.088	-0.018	0.067	0.076	0.196	0.014	-0.006	-0.009
I27 Work-related injury insurance	-0.176	0.073	<b>0.806</b>	-0.054	0.080	0.011	-0.079	0.053	0.108	0.078	-0.041	-0.033	-0.002
I28 Housing fund	-0.194	0.127	<b>0.707</b>	0.090	0.004	-0.064	-0.015	-0.112	0.143	-0.104	0.056	0.091	-0.001
I29 Hardship subsidies	0.108	<b>-0.463</b>	0.364	-0.006	0.134	-0.140	-0.123	-0.083	-0.254	-0.078	-0.001	-0.183	-0.108
I4 Marital status	0.087	0.061	-0.090	-0.170	0.045	-0.059	<b>0.759</b>	0.091	-0.098	-0.099	0.065	0.035	-0.011
I18 Number of family member	-0.006	0.222	0.065	0.091	<b>0.888</b>	-0.013	-0.012	0.059	0.058	0.054	-0.003	0.160	0.060
I6_Re1 Number of child	-0.034	0.187	0.125	0.063	<b>0.570</b>	-0.010	0.253	0.075	0.105	0.074	-0.070	0.319	0.220
I6_Re2 Number of elders	0.116	0.109	-0.013	0.046	<b>0.820</b>	-0.064	0.020	0.013	-0.019	0.059	0.007	-0.175	-0.088
I11 Type of family	0.041	<b>0.641</b>	0.052	0.136	-0.040	-0.082	-0.068	-0.054	0.065	0.069	-0.099	0.057	0.223
I12_Re2 Household years in residence	-0.024	0.186	0.089	0.398	0.096	<b>-0.662</b>	0.238	0.013	0.044	0.090	0.010	-0.033	0.026
I14_Re Ownership	-0.096	<b>0.834</b>	0.023	0.213	0.086	0.033	0.001	-0.148	0.042	0.055	-0.020	0.029	-0.018
I19 Rent	-0.094	<b>0.838</b>	0.018	0.215	0.118	0.034	0.006	-0.138	0.081	0.063	-0.013	0.029	-0.014
I20_Re Facing moving-out pressure	-0.117	-0.141	-0.049	0.005	0.057	-0.058	-0.010	<b>0.842</b>	-0.028	-0.050	0.078	-0.011	-0.046
I20_Re2 Facing moving-out pressure caused by exceeded family income	0.021	-0.126	0.052	-0.002	0.034	0.029	-0.004	<b>0.853</b>	0.035	0.041	-0.075	0.090	0.021
I31 Household income (monthly)	0.022	<b>0.753</b>	0.172	0.049	0.274	-0.060	-0.073	-0.016	0.108	-0.125	0.094	-0.020	-0.103
I32 Household expenses (monthly)	0.021	<b>0.701</b>	0.199	-0.015	0.343	-0.037	-0.068	-0.056	0.071	-0.093	0.082	-0.010	-0.160
City_area1 Inner city location	0.146	0.147	0.088	0.342	-0.013	<b>0.556</b>	0.152	0.048	-0.291	0.042	0.085	-0.062	0.008
Location_Cluster	-0.218	-0.352	-0.102	-0.119	0.154	-0.204	-0.001	0.025	0.400	0.055	-0.138	0.208	0.000
Population of community	0.025	-0.258	0.017	<b>-0.915</b>	-0.092	-0.044	0.087	-0.009	0.006	0.051	0.016	0.039	0.014
Re_scale	0.013	0.216	-0.018	<b>0.916</b>	0.067	0.108	-0.080	-0.011	-0.051	-0.058	-0.007	-0.064	-0.014
Dwellingtype	-0.033	0.011	0.019	0.183	-0.017	<b>0.831</b>	0.075	-0.043	0.148	-0.001	-0.108	0.005	-0.003
A1 Employment status	<b>-0.974</b>	0.020	0.095	0.000	-0.014	-0.012	-0.025	0.022	0.024	0.115	0.104	-0.001	0.044
A3 Employment contract	<b>0.974</b>	-0.020	-0.095	0.000	0.014	0.012	0.025	-0.022	-0.024	-0.115	-0.104	0.001	-0.044
A4 The way of job participation	<b>0.974</b>	-0.020	-0.095	0.000	0.014	0.012	0.025	-0.022	-0.024	-0.115	-0.104	0.001	-0.044
A18 Previous employment status	<b>0.698</b>	-0.020	-0.020	0.002	0.061	-0.007	0.090	-0.012	-0.024	0.398	0.143	0.045	0.068
I30_Re6 Occupation	0.109	0.293	-0.118	-0.105	0.044	-0.218	<b>-0.511</b>	0.070	-0.161	-0.068	0.141	-0.217	-0.022
A7 Commuting mode	<b>0.974</b>	-0.020	-0.095	0.000	0.014	0.012	0.025	-0.022	-0.024	-0.115	-0.104	0.001	-0.044
A8 Commuting time	<b>0.974</b>	-0.020	-0.095	0.000	0.014	0.012	0.025	-0.022	-0.024	-0.115	-0.104	0.001	-0.044
A9 Commuting cost	<b>0.974</b>	-0.020	-0.095	0.000	0.014	0.012	0.025	-0.022	-0.024	-0.115	-0.104	0.001	-0.044
A12A24_1 Long commute distance	-0.351	-0.028	-0.016	0.001	0.160	0.026	-0.166	-0.117	-0.096	<b>0.643</b>	-0.050	0.027	-0.015
A12A24_2 Inconvenient transportation	-0.164	0.042	0.158	-0.083	0.018	-0.049	-0.028	0.073	0.107	<b>0.743</b>	0.088	0.008	0.085
A12A24_3 For higher wage level	-0.244	0.046	0.032	-0.034	0.031	-0.101	0.028	0.007	-0.090	0.030	<b>0.690</b>	-0.029	0.102
A12A24_4 For better work environment	-0.137	0.052	0.036	0.044	-0.083	0.005	-0.046	0.010	0.130	0.210	<b>0.658</b>	0.003	-0.297
A12A24_5 For better social network	-0.101	-0.128	-0.067	-0.021	0.020	0.052	-0.033	-0.025	0.148	-0.235	<b>0.588</b>	0.150	0.382
A12A24_6 Instinct features of the occupation	-0.135	0.022	-0.017	-0.020	0.033	-0.016	-0.012	-0.020	-0.079	0.100	0.039	-0.106	<b>0.844</b>
Eigenvalues of main components	6.850	3.884	2.379	2.226	2.175	1.633	1.630	1.628	1.551	1.501	1.479	1.282	1.162
Contribution rate of main components (%)	17.126	9.710	5.949	5.566	5.437	4.083	4.075	4.071	3.879	3.753	3.698	3.205	2.905
Accumulative contribution rate of main components (%)	17.126	26.836	32.785	38.350	43.787	47.870	51.946	56.017	59.895	63.649	67.346	70.551	73.456

Note: Factor extraction analysis method: principal component analysis. Rotation method: Varimax with Kaiser Normalization. Source: own draft, 2017. Data source: Questionnaires in 13 social housing communities in Guangzhou (n = 660). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

### 9.2.3.2 Logistic regression analysis on the determinants of job relocation

The research simulates models for the two dependent variables, “job relocation” and “intention of changing workplace”. The dependent variables are binary variables with sub answers “yes” and “no”. For example, in the first regression on job relocation, people who have changed workplace are given a value of “1” and those who have not changed are given a value of “0”. These two regressions on job relocation involve all independent variables of the “endogenous” and “employment” groups, and first group “workplace” of “perceived reasons” (see Tab.9.7, “A12A14\_1” to “A12A24\_6”).

According to their sub categories, the independent variables included are of three types: scale variables, binary variables, and nominal/categorical variables. Of these, the answer to the scale variable (e.g. extracted factors, “I3 age” and “I2\_Re2 household years in residence”) is values with real meanings and the answer to the binary variable (e.g. “I2\_Re2 gender-female” and “City\_area1 inner city location”) consists of two value categories “yes” = “1” and “no” = “0”. The significant values of answers to binary variables and scale variables make them possible to be copied directly into the regression analysis. The codes of the mutually independent sub answers to the rest of the nominal/categorical variables are not equal to real values. Calculating code numbers in this regard may destroy the independence of the sub answers and even result in mistakes. In order to correct calculations on categorical variables in further analysis, the study defines categorical variables into two types; one consists of independent sub categories and one consist of ordinal (ascending/descending) categories. Independent sub categories refers to those with non-successive relationships between them. For instance, “I4 marital status” contains three answers: single, married, divorced or widowed coded 1, 2, and 3 respectively. The three answers are each independent with a non-mathematical order. In addition, “I5 educational background” has encoded seven ascending sub categories which are mutually exclusive. However, an ascending arrangement exists among them. In terms of different regulations, the first independent categorical variable is redefined using method “indicators<sup>16</sup>” and the second ordinal categorical variable is recalculated using method “difference<sup>17</sup>”. Among them, four factors, “I4 marital status”, “Location\_cluster”, “Dwellingtype” and “I30 occupation”, are redefined with method “indicators”, and variable “I5 educational background” is transferred using method “difference”.

Logistic regression comprises six testing methods to build up models: Forward-Conditional, Forward-LR (Likelihood-Ratio), Forward-Wald, Backward-Conditional, Backward-LR and Backward-Wald. All these methods test entering and excluding procedures in each step, also called as “stepwise”. Both Conditional and LR examine all independent variables based on their fit to the entire model, while the Wald test only examines the entered variables. The first two tests may provide models with a close fit and higher explanation degree than Wald test. At the same time, examining on entire model to simulate a more reliable result may cause more insignificant variables enter the final model. To consider advantages and disadvantages of 6 testing methods, our exploration selects two methods, Forward-Conditional and Backward-Conditional, to form two models. Then to decide final one based on fit percentage.

**Determinants of occurred job relocation.** The aim of first regression analysis is to seek the determinants of job relocation behaviour. The dependent variable is from Question A11 of the survey. Four answers were given as options for Question A11: 1) change of workplace, no change of job, 2) change of workplace and type of work, 3) change of the type of work, no change of workplace and 4) no change at all. The people who chose either answer 1) or 2) means they have changed their workplace. Then this study created a new variable “A11\_Re1”, and transferred the first two categories of “A11” to the new answer “yes” with a value “1” of “A11\_Re1”, regrouped the third and fourth answer of “A11” into answer “no” with value “0”. Therefore, the dependent variable is “A11\_Re1”, a dummy variable which refers to having changed the workplace or not.

As mentioned, the Forward-Conditional and Backward-Conditional are applied to select potential indicators. The model 1 shows the data of forward progress and the model 2 displays information obtained from backwards progress (see Ta.9.9). Model 1 stops at step 3 and extracts in total three variables (i.e. employment participation, inconvenient spatial

<sup>16</sup> Indicator is a method for reorganizing categories of nominal variable in regression analysis. Each sub category is redefined into a dummy variable with two answers ‘yes’ in value ‘1’ and ‘no’ in value ‘0’.

<sup>17</sup> Difference refers to an approach normally applied in dispose of ordinal categorical variables. The value of each category is compared to the average value of all former categories to search whether increasing effects in regression analysis exist along with ordinal levels.

connection between job and housing, for better working experience), with a model fit of 93.5%. Model 2 has tested 15 steps, finally seven variables remain to explain job relocation. In comparison with Model 1, the result of the second test (backwards progress) shows a higher fit percentage of 94.0% with four added variables relating to educational background (i.e. no education, primary school, middle school, high school or technical secondary school). Owing to the higher explanatory degree of Model 2, this study takes the seven entered variables to form the final equation:

**Tab. 9.9 Logistic regression models for the determinants of the occurred job relocation**

Variables in the Equation		Model 1 (Model fit = 93.5%)					Model 2 (Model fit = 94.0%)				
Code	Name	Test methods: Forward-Conditional, stopped at step 3					Test methods: Backward-Conditional, stopped at step 15				
		Coefficient	P-value	OR	95% CI (n=660)		Coefficient	P-value	OR	95% CI (n=660)	
Lower	Upper				Lower	Upper					
FAC1	Employment participation	-1.119	0.001	0.327	0.169	0.632	-1.153	0.001	0.316	0.169	0.632
FAC10	Inconvenient spatial connection between job and housing	1.508	0.000	4.520	2.964	6.891	1.610	0.000	5.003	2.964	6.891
FAC11	For better working experience	0.688	0.000	1.989	1.421	2.784	0.750	0.000	2.118	1.421	2.784
I5	Educational background							0.716			
I5(1)	No education						-1.542	1.000	0.214	0.000	
I5(2)	Primary school						18.598	0.998	1.19E+08	0.000	
I5(3)	Middle school						12.329	0.998	226262	0.000	
I5(4)	High school or technical secondary school						8.255	0.998	3846.536	0.000	
<b>Constant</b>		-3.501	0.000	0.030			-10.911	0.997	0.000		

Note: Dependent variable: A11\_Re1: Regrouped A11 Have you changed the place of work? Probability of stepwise, enter <= 0.050, remove >= 0.100). CI refers to confidence interval, and OR refers to odds ratio.

Source: own draft, 2017. Data source: Questionnaires in 13 social housing communities in Guangzhou (n = 660). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Job relocation =** - 10.911 - 1.153 · Employment participation + 1.610 · Inconvenient spatial connection between job and housing + 0.750 · For better working experience – 1.542 · No education + 18.598 · Primary school + 12.329 · Middle school + 8.255 · High school or technical secondary school

Drawing on p-values, we notice that first three indicators are significant and the last four determinants about education are insignificant. The significances levels of I5(1), I5(2), I5(3), I5(4) are 1.000, 0.998, 0.998 and 0.998 respectively. In the test of logistic regression, some insignificant variables may enter the equation for a model with higher explanatory importance. Thus, our study does not address significance too much and accepts indicators with p-values over 0.05. Either the coefficient or OR (Odd-Ratio) can reflect correlations between the predictor and the dependent variable. The minus coefficient refers to the negative effect and positive value refers to the positive effect, and the bigger absolute value indicates the stronger correlations. An OR smaller than 1 implies a negative relationship and a value over 1 means a positive effect from the indicator. Generally, OR over 4 represents strong effects.

The coefficient of “employment participation” is -1.153 and the OR is 0.316, which points to a negative effect on job relocation behaviour. Surveyed social housing residents with higher participation in employment may be less likely to change their workplaces than those who are less engaged in employment. That is to say, the higher the stability of the job or the more work experience the lower the likelihood of job relocation by moving to a new residential area. In contrast, resettlement in social housing may have a stronger effect on people who have no stable jobs or possess less experience. They may be subject to changing workplaces with the change in residence. The second predictor is the “inconvenient spatial connection between job and housing” whose coefficient is 1.610 and OR is 5.003. The OR value over 4 indicates that this indicator strongly positively affects job relocation behaviour. The more inconvenient the traffic, the more changes of workplace will happen. If the new residential area creates difficulty in reaching work, the surveyed people may highly possibly find a job in a new location. The predictor, “for better working experience”, is positively linked to job relocation. Depending on the 0.750 coefficient value and the 2.118 OR value, we find the effect of this

factor is relatively weak. The aim of getting a better working experience may encourage the surveyed people to change their original workplaces.

Additionally, educational background also acts as an important influence. “No education” is negatively related to work change behaviour, while the factors “primary school”, “middle school” and “high school or technical secondary school” produce positive impacts. As seen from Tab.9.9, the coefficients and OR of people with no education are respectively -1.542 and 0.214. Surveyed people who never received education are less likely to change workplace. The other three predictors of educational background are all positively associated with job relocation behaviour. Coefficient values are present at very high levels: 18.598 of predictor “primary school”, 12.329 of “middle school” and 8.255 of “high school or technical secondary school”. Positive values imply that educational background may contribute to changing the workplace. Moving into social housing in a new residential area results in job relocation among people who have an educational background. The converse results between the three indicators relating to educated and “no education”, revealing that education acts as a factor that may limit job change among educated people. Since they are uneducated, the surveyed people may have limited access to job opportunities, which further results in a low possibility of finding a new workplace.

Moreover, decreasing values with increasing educational background means the surveyed people have more education, accompanied by lower amounts of job relocation. Particularly for people who have only completed primary education, a new living place resulted the most work relocation. This effect drops in people who completed middle school education, and falls even lower in people who completed high school education. This phenomenon may be a result of job stability. People with more education may have a greater possibility of engaging in relatively stable jobs than those with a lower educational background. Resettlement may easily influence less educated people to find a new job. Consequently, people who are more education show a lower occurrence of job relocation.

**Tab. 9.10 Logistic regression models for the determinants of the intention to change jobs**

Variables in the Equation		Model 1 (Model fit = 87.3%)					Model 2 (Model fit = 87.3%)				
		Test methods: Forward-Conditional, stopped at step 8					Test methods: Backward-LR, stopped at step 11				
Code	Name	Coefficient	P-value	OR	95% CI (n=660)		Coefficient	P-value	OR	95% CI (n=660)	
					Lower	Upper				Lower	Upper
FAC1	Employment participation	-5.066	0.002	0.006	0.000	0.150	-5.066	0.002	0.006	0.000	0.150
FAC2	Household economic situation	0.953	0.005	2.592	1.332	5.045	0.953	0.005	2.592	1.332	5.045
FAC4	Size of community	-0.576	0.053	0.562	0.314	1.008	-0.576	0.053	0.562	0.314	1.008
FAC8	Moving-out pressure	-3.203	0.005	0.041	0.004	0.384	-3.203	0.005	0.041	0.004	0.384
FAC9	Living security	-0.829	0.004	0.437	0.250	0.764	-0.829	0.004	0.437	0.250	0.764
FAC10	Inconvenient spatial connection between job and housing	0.938	0.000	2.556	1.599	4.085	0.938	0.000	2.556	1.599	4.085
FAC11	For better working experience	1.362	0.000	3.903	2.258	6.747	1.362	0.000	3.903	2.258	6.747
I2_Re	Gender-female	-1.635	0.006	0.195	0.060	0.631	-1.635	0.006	0.195	0.060	0.631
	<b>Constant</b>	<b>-7.575</b>	<b>0.000</b>	<b>0.001</b>			<b>-23.233</b>	<b>-7.575</b>	<b>0.000</b>	<b>0.001</b>	

Note: Dependent variable: A23 Do you intend to change your place of work? Probability of stepwise, enter <= 0.050, remove >= 0.100). CI refers to confidence interval, and OR refers to odds ratio.

Source: own draft, Oct, 2017. Data source: 182 questionnaires (respond “Yes” in Question A1 Are you employed at present) In 13 social housing communities in Guangzhou (n = 660). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Determinants of intention to change workplace.** With the purpose of exploring the determinants of intention of change workplace, we carried out a logistic regression for the variable “A23 Do you intent to change your place of work” in this part. This survey question has two answers “yes” and “no”, which can be treated as a dummy variable in regression analysis. Since only employed interviewees were qualified to answer this question, only a total of 182 cases were included. Independent variables of this intention analysis are the same to those in the above regression about job relocation. In same way, this examination selects one forward method and one backwards method to test the entered



variables. The principle of both Forward-Conditional and Backward-Conditional is used to test the fit percentage for the whole model, so the final equation will be the one with the highest model fit. Forward calculation stopped at step 8, and backward progress took place in 11 steps. As seen from Tab.9.10: two models for both methods include the same variables and corresponding coefficients. The model fit is 87.3% and final equation is as follows:

**Intention to change workplace** = - 7.575 – 5.066 · Employment participation + 0.953 · Household economic situation – 0.576 · Size of community – 3.203 · Moving-out pressure - 0.829 · Living security + 0.938 · Inconvenient spatial connection between job and housing + 1.362 · For better working experience - 1.635 · Gender-female

A total of eight indicators is entered the model to describe the intention of changing workplace, of which seven are significant with a p-value smaller than 0.05, and the factor “Size of community” has a p-value of 0.053. This study accepts all the factors entered in the equation. An overview of indicators: “FAC1 employment participation”, “FAC4 size of community”, “FAC8 moving-out pressure”, “FAC9 living security” and “I2\_Re gender-female” display minus coefficient and below 1 OR values, which indicate their negative relationships with dependent variable. Another three indicators “FAC2 household economic situation” “FAC10 inconvenient spatial connection between job and housing” and “FAC11 for better working experience” have positive coefficients and OR values above the value of 1. This implies that these three indicators correlate positively to the variable “intention to change workplace”.

The strongest determinant is “employment participation” with a value -5.066. This correlation provides evidence that the stable and continuing labour participation may negatively affect people’s intention to change workplace. Those respondents with unstable employment have stronger aspirations for work mobility. In other words, moving into social housing may produce psychological effects on changing job location among workers who participate less. Moving-out pressure has a strongly negative effect. Coefficient -3.203 and OR 0.041 indicate that people in households that have to move out of social housing have fewer intentions of changing workplace. Unstable residential conditions may reduce intentions related to job mobility.

The size of the community produces weakly negative effects. Surveyed workers in large communities with more people present weaker aspirations to change workplace than those in smaller communities. The economic condition in the household displays a weakly positive correlation, with a coefficient of 0.953 and OR is 2.592. This indicator comprises information on family income and low-income subsidies, which may reflect economic conditions in the household. Surveyed workers with better economic ability show a stronger desire to find a new workplace after moving into social housing. Conversely, people with weak economic ability have accordingly weak intentions to change jobs. Then, the coefficient -0.829 and OR 0.437 of “living security” mean that the indicator negatively and weakly correlates with the intention. Living security is an indicator based on having health insurance and pension. People with living security may think less about changing workplace, and people without any insurance are more likely to have the intention to change workplaces. As we know, having health insurance or pension is normally linked to employment contracts. Employees in formal job positions are commonly provided with health insurance and pension by the employer. Therefore, unstable job opportunities are more likely to be influenced by the change of living location, and result in a stronger desire to find a new workplace. The factors of “inconvenient spatial connection of job and housing” and “for better working experiences” have medium positive effects on the potential plan to change jobs. This evidence of coefficient 0.938 indicates that inconvenient spatial connections between job and housing are tend to prompt the intention to change workplace. That is to say, difficulty in getting to the workplace caused by a new residence may boost people’s strength of intention to find a new job in the future. The coefficient of the factor “for better working experiences” is 1.362. Consequently, higher wage levels, better social networks and stronger personal interests may become more attractive in driving people’s intention to find a new workplace. The intention to change jobs may rise with the better working conditions. The predictor “Gender-female” is negatively associated with the dependent variable. The coefficient -1.635 reveals gender-female is a medium force and negatively affects people’s intention to change workplace. Female workers have smaller aspirations than males to change workplace, and male workers may have a higher possibility in the future of finding a new workplace.

**Sub conclusion.** To summarise findings from the radar chart and the regression analyses, effective indicators of job relocation after moving into social housing have been listed in Tab.9.11. There are three main groups into which all effects can be classified: employment, individual and household. The surveyed people who have changed workplace

after resettlement are shown in column “occurred job relocation” and those who did not but intend to change workplace in the near future are shown in column “intention of change workplace”. As displayed in Tab.9.11, both actual job relocation and intention are affected by employment factors like location, stability and work experience. Education only affects the behaviours of people who have already changed workplaces, while household features (i.e. economic situation, moving-out pressure and living security) only influence surveyed people’s intentions.

1) Employment participation greatly reduces the occurrence of job relocation. Job participation comprises two aspects: contract and continuous participation in a work position, which respectively implies job stability and work activity. Its impact on people who have changed workplace stays at a medium negative level, and greatly increases to a strong level in people who intend to change jobs. Negative correlation means temporary workers in social housing may have a greater possibility of changing workplaces. The difference between the two coefficients reveals high stability of jobs and persistent participation in employment may reduce the desire to find a new workplace. The presence of a stable job means people will be less likely to change jobs with residential movement.

2) Inconvenient spatial connection between job and housing may result in a change in workplace. Inconvenient spatial connection acts as a positive factor. For respondents who have moved into a social housing community, inconvenient spatial connection between job and housing is an important impetus for job relocation. The significance of this factor for intentions of change workplace decreases. There are two enclosed elements, long distance and inconvenient transportation. According to the result of the radar chart (see Fig.9.5), the effect of long distance on job relocation may be almost immediate and persistent, and the influence of inconvenient transportation may have a strong and almost immediate effect. That is to say, if moving into social housing results in difficulty getting to jobs, some people who are unsatisfied with the accessibility may react almost immediately and may adjust to a new job location.

3) Better work experiences is a lasting motivation for changing workplace. Regression analyses have confirmed the positive effects of better experiences on behaviour and intention regarding job relocation. Coefficients are respectively 0.750 and 1.362, which implies the influence is weak but long-term effective.

4) Job mobility reduces are educational background increases. Education only affects behaviour that occurred in relation to job change. After moving into the new living location, uneducated people show less willingness to change jobs than educated people. Lack of work skills may lead to narrow employment choices for uneducated people and fewer job opportunities may greatly reduce their intentions to change jobs. Another finding is the more education the individual completed, the lower the possibility of changing workplace. As indicated by the descending coefficients 18.598, 12.329, 8.255 from primary school to high school, it would appear that the job location of less educated people is more likely to be influenced by residential location.

5) Male workers are more likely to change workplace than female workers. Differences also exist between male and female as female respondents show weaker intention with regard to job mobility, and male respondents may have a greater possibility of changing workplaces in future.

6) Household economic conditions may affect an individual’s intention to changing workplace. Family economic levels positively influence job relocation intentions. A coefficient of 0.953 means higher family income may contribute to elevated aspirations of relocating workplaces after resettlement, while living security and moving-out pressure have weak and negative effects. Possessing health insurance and pension may reduce people’s intention to change workplaces. If a family is confronted by the risk to moving out of social housing, people have no plan to find a new workplace.

Tab. 9.11 Effects of job relocation behaviour on social housing residents

Factors		Dependent variables	Occurred job relocation <sup>a</sup>	Intention of change workplace <sup>b</sup>
		Correlation		
Employment	Employment participation		Medium negative (-1.153)	Strong negative (-5.066)
	Contract (stability)			
	Continuous participation			
	Inconvenient spatial connection between job and housing <sup>c</sup>		Medium positive (1.610)	Weak positive (0.953)
	Long distance (see Fig.9.5)			
	Inconvenient transportation (see Fig.9.5)			
	For better work experiences <sup>d</sup>		Weak positive (0.750)	Weak positive (1.362)
Higher salary (see Fig.9.5)				
Better work environment (see Fig.9.5)				
Better social network (see Fig.9.5)				
Individual	Gender-female			Medium negative (-1.635)
	Educational background			
	No education		Medium negative (-1.542)	
	Primary school			
	Middle school			
High school or technical secondary technical school		Strong positive (18.598)		
		Strong positive (12.329)		
		Strong positive (8.255)		
Household	Household economic situation			Weak positive (0.953)
	Moving-out pressure			Medium negative (-3.203)
	Living security <sup>e</sup>			Weak negative (-0.829)
	Health insurance pension			

Note: <sup>a</sup> The data (coefficients of factors) in this column are a result of Tab.9.9. <sup>b</sup> The data (coefficients of factors) in the column come from Tab.9.10. <sup>c</sup> This indicator is the tenth factor extracted by way of factor analysis (see Tab.9.8), original variables included are “A12A24\_1 Long commute distance” and “A12A24\_2 Inconvenient transportation”. <sup>d</sup> Indicator “for better work experience” is the eleventh extracted factor of factor analysis (see Tab.9.8), which comprises three original variables “for higher wage level”, “for better work environment” and “for better social network”. <sup>e</sup> Living security is the ninth variable extracted by factor analysis (see Tab.9.8), which stems from two variables “health insurance” and “pension”. Source: own draft, July 2018.

### 9.3 The change in occupations and effect

Many investigations regarding the job–housing relationship focus only on job location, and ignore the effects of the environment around the residence. Besides the new spatial connections between work and residence, moving into social housing neighbourhood presents residents with a new issue, how to integrate into the local environment in terms of economics, employment and interpersonal communication. Job change is not only influenced by location, but also by the social attributes of the place, like an increase in job opportunities, main services and interpersonal communication. Both spatial factors such as the distance and transport connection and social factors like individual selection and work opportunities in the local area may contribute to the intention to change workplace or occupation. Following the study of the movement of employment and possible reasons in the above section, this part focuses on the change in occupation and its causes.

Firstly, our investigation will centre on the working environment and respondents’ access to employment opportunities. A number of people have explored the issue by means of the index of dissimilarity.<sup>18</sup> Based on the number of employees and number of targeted respondents in the defined spatial unit, this index provides a possibility to see similarities and disparities among geographic units regarding the accessibility of job opportunities. However, based on statistical data (The sixth census in Guangzhou), employed people are counted according to their residential location rather than their workplace, thus it is hard to depict the true work environment of a geographic unit. The counts based on residence only represent the employment status of respondents rather than the job opportunities or occupational level in a geographic

<sup>18</sup> The formula of the index of dissimilarity:  $A = \frac{1}{2} \sum_{i=1}^n \left| \frac{b_i}{B} - \frac{e_i}{E} \right|$ , where:  $b_i$  refers to social housing residents of the sub district  $i$ ,  $B$  refers to the total number of social housing residents of research area,  $e_i$  refers to the employed population in target occupation of sub district  $i$ , and  $E$  refers to total employed population in target occupation of research area (Stoll, 2006: 831; Stoll & Covington, 2012: 2503; Liu & Painter, 2012: 989).

unit. Owing to the lack of distributed data about the location of the labour market, this study was unable to depict the spatial connection between the targeted group and the specific employment using the index of dissimilarity. Instead, we draw the percentages of employees in different occupations to ascertain the labour participation and employment features of proximate respondents. An environment with a high concentration of people in one occupation may influence perceptions about occupations and may further lead to work change. Afterwards, this research will attempt to explore the dynamics of occupational change in social housing workforces by way of regression analysis.

### 9.3.1 Occupational level of nearby job opportunities around social housing locations

According to the classification used by the Guangzhou census, all occupations have been divided into six primary groups. Fig.9.6 presents six maps to indicate the situation in six different categories. The patch in each map represents the proportion of employees in the target occupational group to the total local workforce over 16 years old. By shaping this ratio across research area, we can perceive the intensity of employment in every sub district unit. In scanning the maps of the distribution of the workforce, it is apparent that almost all social housing communities are located in units where people are largely employed in basic commercial or residential services. That is to say, the surveyed individuals are mostly living with workers who are engaged in jobs in the low-skilled category. The opposite situation is displayed in the rest of the four figures, social housing is spatially situated in places with a small percentage of employees in other occupations: technicians, clerks, professional technicians and managers. This illustrates that the surveyed people are living separately from higher skilled workforces; they have limited opportunities to obtain related personal resources and information. Regarding the six enclosed maps in Fig.9.6, we explain them one by one in detail:

(a) Agriculture, farming, fishing and forestry industries: from the first figure we see that people who take part in primary sectors such as agriculture, farming, fishing and forestry are widely located on the very fringes of city like the northern subdistricts of Luogang and Baiyun, and small land parcels on the southwest margin. Similar to most citizens, social housing respondents are located separately on these land parcels.

(b) Commercial services, residential services and other services: Represented by Guocun, Anxia, Zede, Huize Yaxuan and Likang, neighbourhoods that are located in units with the highest participant ratios (over 30%) in commercial and resident services. The rest of the communities such as Fanghe, Dang'en, Jude, Tangde, Guangdan, Tai'an and Jinshazhou, are situated in patches with a middle scale of 20.1–40.0%. Our focus then turns to the situation in the 13 surveyed communities. With reference to data about respondents' occupations (see Tab.8.4), communities lie in places with high ratios; Guocun, Anxia, Zede, Huize Yaxuan and Likang respectively contain 76.9%, 75.0%, 61.4%, 66.7% and 77.8% of employees engaged in this occupational sector. These data have to a large extent surpassed the level of the rest of the neighbourhoods (40.0–50.0%). The resettlement of a large number of low-income families in social housing may result in this high ratio; simultaneously the local economic environment may also give rise to the concentration of employments in these service sectors.

(c) Technicians in production, transportation, operatives etc.: The 13 surveyed communities lie in sub districts with the lowest participation ratio (0.1–15.0%) for production, transportation and operatives services. This result is consistent with the percentage of surveyed employees in this sector. According to the data shown in Tab.8.4, 16.5% of inhabitants, on average, in social housing communities are occupied in this industry. By comparing the five scales in Fig.9.6 (c), the percentages of the 13 communities all stay at a low level under 25.0%. Apart from three communities in the western cluster, Tangde, Tai'an and Jinshazhou, the other seven communities consistently present a lower than 15.0% percentage in technical occupations.

(d) Professional technicians: Professional technicians are living centrally in the adjoining districts of Yuexiu, Haizhu and Tianhe. From the centre to the fringe a decreasing trend is indicated. Tangde, Tai'an and Guangdan are situated in sub districts with the highest proportion of professional technicians and the other ten communities are located in peripheral units in highly concentrated areas. However, different to spatially proximate respondents, professional technicians in social housing neighbourhoods occupy a much larger percentage. As shown in Tab.8.4, the average proportion of surveyed people is 21.0%. This number exceeds the upper level of 20.0% of any sub district (see Fig.9.6 (d)). In terms of the surveyed data about the occupations of targeted residents (see Tab.8.4), in Guangdan 14.3% of employees are working as professional technicians, in Tai'an 15.4%, in Zede 10.5% and in Likang 11.1%. Another eight communities have more than 16.0% of people participating in this sector. In all, residents in social housing communities demonstrate

a much higher weight of professional technicians among all employees. This fact may reveal that people who work in a stable and high-skilled position are more like being a central workforce in social housing communities where weak employment engagement is commonly found.

(e) Clerks and related workers: The highest concentration of clerks are found in a few of separate patches of units. There is a certain distance between most communities to these poles. The 13 cases are mostly located in places with second low (4.1%-8.0%) or intermediate (8.1-12.0%) percentage of clerks etc.. At the same time, employees in the 13 communities are present in very low proportions in this occupation (see Tab.8.4).

(f) Managers in state agencies, party organizations and enterprises: According to dark shading of the patches in Fig.9.6 (f), respondents in sub districts in marginal area demonstrate a higher percentage with regard to acting in this sector. The 13 cases communities are spatially proximate to these high concentrated areas with nearly 80.1–90.0% of managers. The data in Tab.8.4 indicates that a very small percentage of surveyed people in the 13 cases are participating in management services. On average, only 2.1% of surveyed people perform as clerks and managers. This level stays at the very bottom level compared to any other places on the map (see Fig.9.6 (f)). This reveals that related occupations like clerks or managers are rarely participated in occupation among the targeted group.

In conclusion, there are two main outcomes that can be identified: firstly, social housing residents mainly reside in areas where commercial employment and residential employment prevalent. In addition, most surveyed people are occupied in the basic services sectors rather than in higher-skilled sectors, particularly management or office-related jobs. Secondly, there is interaction between the occupational level of social housing residents and local low-skilled occupations. As indicated, the 13 neighbourhoods and the sub districts where they are located present a consistent trend in the proportion of low-skilled sectors. This means that the local low-skilled employment environment may fit the working ability of the settled social housing residents. High concentrations of job opportunities in services such as agriculture, commercial and residential services, production and transportation may contribute to job participation of residents and vice versa. However, residents seem less influenced by the concentration of high-skilled occupations.

### 9.3.2 Occupational structure of surveyed residents

The outcomes in Tab.8.4 indicate that 79.0% of employed respondents are engaged in lower-skilled occupations, in particular, the percentage reaches 46.1% in commercial services, residential services and other basic services. Additionally, population percentages of other services: agriculture, technical services in production and transportation etc., professional services, management services and other services are 1.7%, 16.5%, 18.7%, 2.4% and 14.7% respectively.

In addition to the current job participation, Tab.9.2 provides employment stability regarding current occupations of surveyed people. As displayed in Tab.9.2, 17.0% of workers in commercial and resident services, 9.1% of technicians in production and transportation etc., 15.4% of professional technicians, 40.0% of clerks and managers and 28.6% of other services have changed their jobs after moving into new residential areas. Respectively 19.0%, 27.3%, 17.9%, 40.0% and 14.3% of people in the above groups have a willingness to take up a new occupation in future. To sum up the percentages of the two groups (people who have changed occupations and people who intend to change occupations) by job category, no significant gaps appear between them. The commercial sector has 36.0% people in total, the technician sector has 36.4%, professional technician sector has 33.1% and the other sectors have 42.9%. Only clerks and the management sector shows very high proportions in the category “have changed” and in the category “intend to change”. However, due to the very few cases in this group, only five person indicated that they work on these occupations, and thus our study prefers to little reference this fact. As seen from the data, no big differences appear to exist between people in such occupations about changing the type of work after resettlement, whether it happened or not.

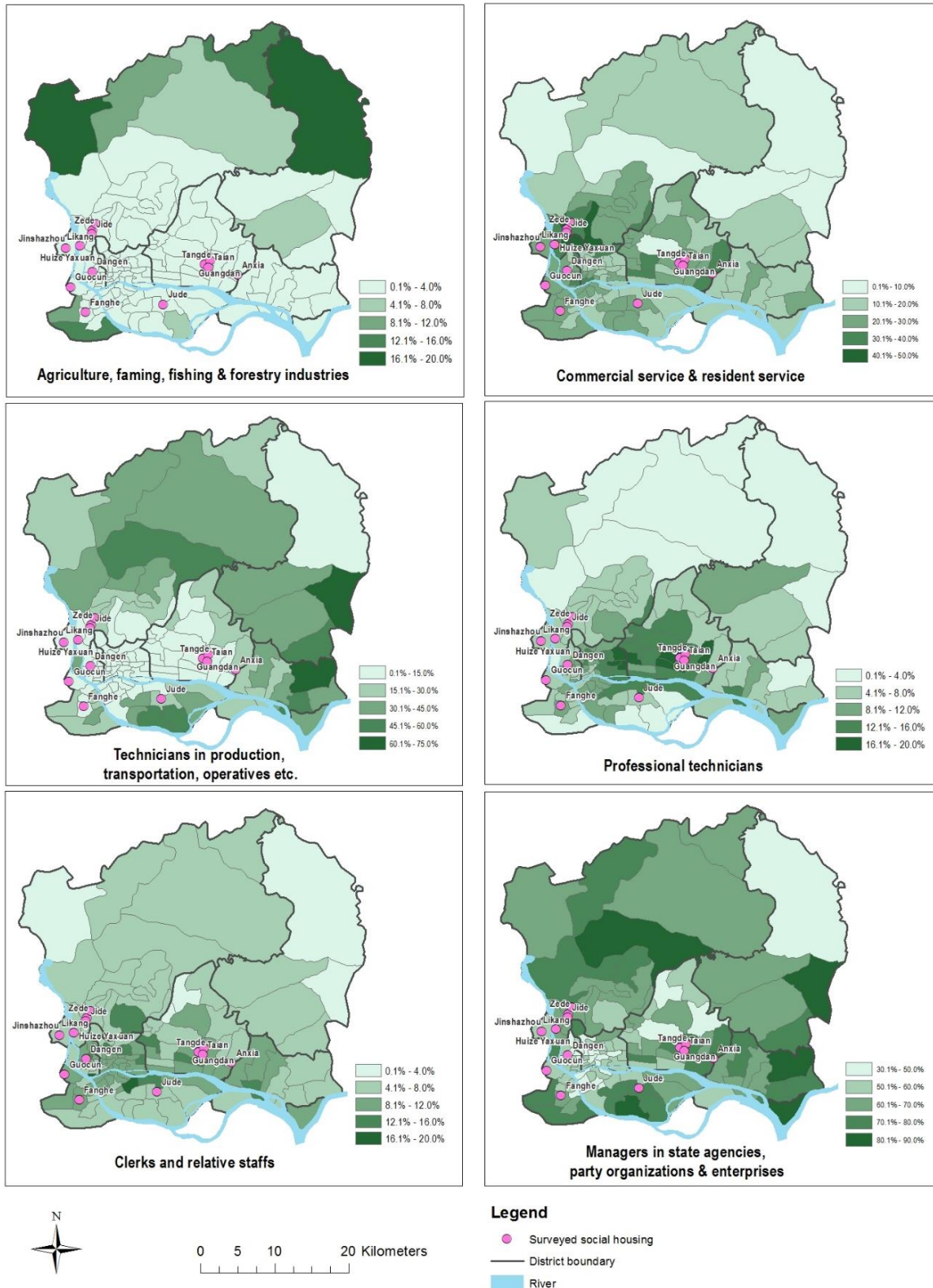
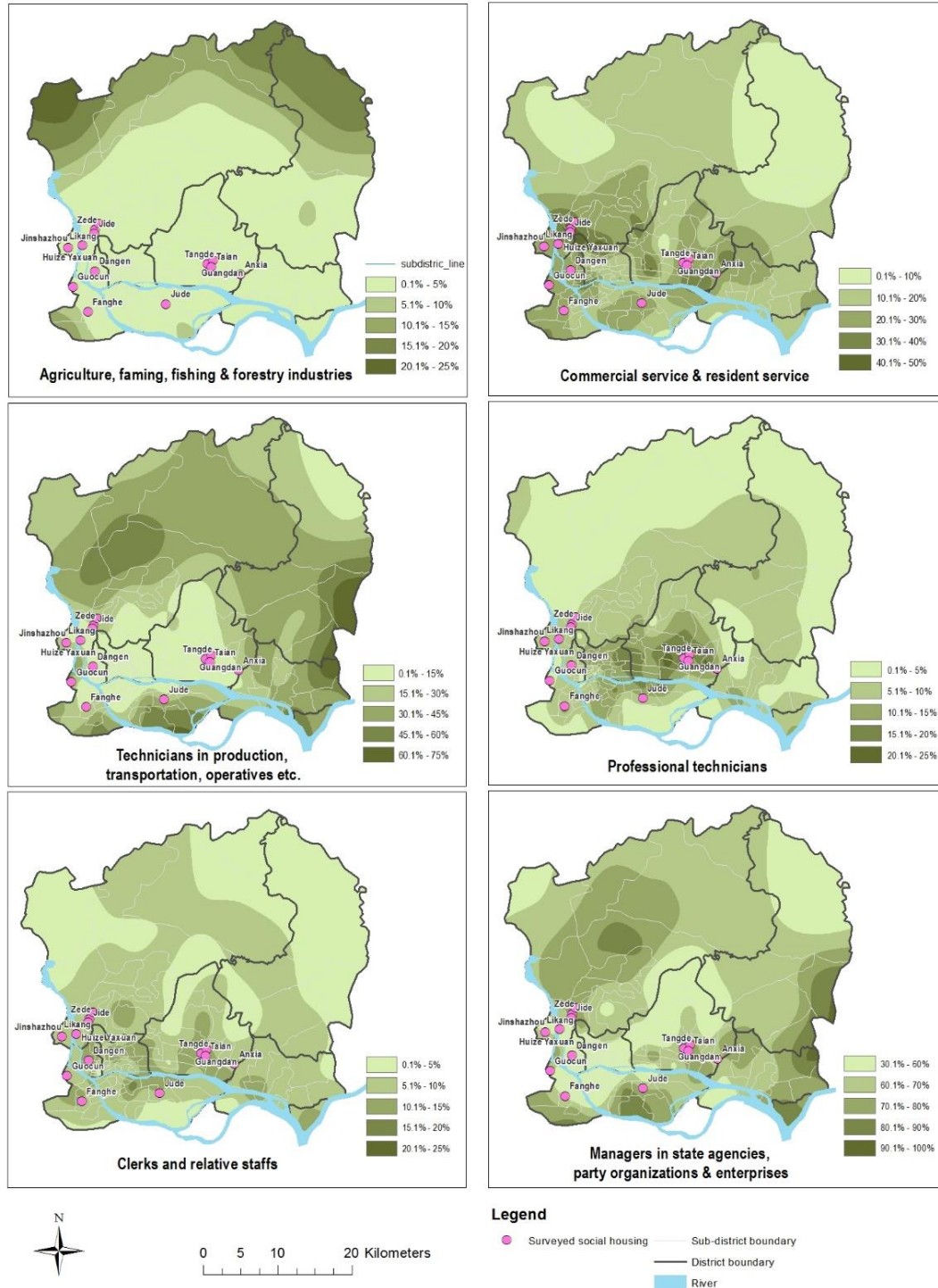


Fig. 9.6 The ratio of the labour force in six categorized occupations to the total of local employees over 16 years old, by subdistrict

Source: Own draft. Oct, 2017. Database: the sixth census, 2010. Included districts: Liwan, Yuexiu, Haizhu, Tianhe, Baiyun, Huangpu and Luogang.





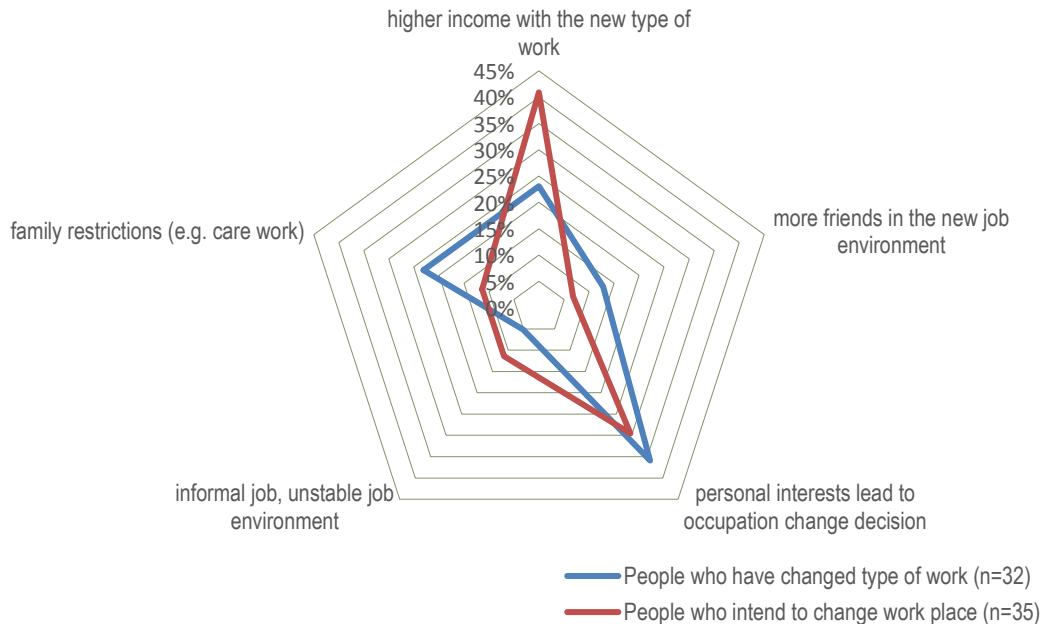
**Fig. 9.7 Interpolation of the ratio of the labour force in six categorized occupations to the total of local employees over 16 years old**

Note: The value of each census sub district has been recalculated by means of interpolation to cover the whole research area. Interpolation method: we select “Spline” as the interpolation method because job distribution is not spatially concentrated to an administrative centre and it does not show a decreasing trend with increasing distance. Instead, the distribution of job opportunities is close to an even, gradual layout. Therefore, we use the “TENSION” spline function (see Equation), based on minimum census unit “sub district”, to interpolate values to the entire research area. The weight is set at “5” and adds 50 sample points to the new surface. Equation:  $R(r) = \frac{1}{2\pi\varphi^2} \left[ \ln\left(\frac{r\varphi}{2}\right) + c + K_0(r\varphi) \right]$ ;  $r$  is the distance between the point and the sample,  $\varphi^2$  is the weight parameter,  $K_0$  is the modified Bessel function,  $c$  is a constant equal to 0.577215. Source: Own draft. Oct, 2017. Database: the sixth census, 2010. Included districts: Liwan, Yuexiu, Haizhu, Tianhe, Baiyun, Huangpu and Luogang.



### 9.3.3 Influence of the occupational change

As to the change in the type of work, we present the reasons from the five dimensions in the empirical survey: higher income, social network, personal interests, family restrictions and occupation. Fig.9.8 depicts the weight of the five factors for the two groups: people who have changed type of work and people who have willingness to change. The outcomes are classified into five aspects: 1) personal interests is the main factor with steady effect. Whether or not respondents have changed jobs or may change in future, personal interests presents a strong and lasting influence on job change decisions. 2) Wage level of work is an important and lagging effective factor. This factor demonstrates a very high weight of around 43% of people who intend to change work type in comparison to 23% of people who changed jobs. That is to say, wage level is not a crucial factor that drives respondents to make a change immediately, but for residents who intend to change after living in social housing for a while, it would have an increasing effect on making a decision. 3) Family restrictions is a critical factor for changing behaviour. The influential strength of family limitations is equal to the second factor of job wage, almost 20%. At the same time, this effect decreases among people who only have intentions to change occupations. 4) Interpersonal relationships and occupation weakly affect changing on work type. 5) Informal job and unstable environment. In conclusion, personal interest, wage level and family restriction are three main influential factors that determine job change behaviours that occurred, but the effects of the economic factor will weaken and the power of the household factor will strengthen among the group that has a willingness to change jobs. That is to say, income level works as a strong influence, which may have a significant effect on people's occupation. However, for those have not changed occupations after moving into social housing communities, the effect of the income level of the occupation is not so strong. Seen from Fig.9.8, the percentage has dropped from 42 to 19%, this remarkable gap between the two groups proves that the economic factor should have a short-term effect functioned immediately on occupational change. In contrast, family restrictions has as a stronger influence among the second group of people who have intentions. Nearly 20% of people may change occupations in the future for this reason, which is much higher than the 5% level of occurred changes. Personal interests is also a main dynamic in occupational change behaviour, and its effects stay almost at the same level among the second group. A slight increase occurred among people who may change occupations in the future. The fact reveals that the effects of personal interests on occupational change are always steady and persistent.



**Fig. 9.8 Reasons given for changing type of work after resettlement in social housing**

Source: own draft, Oct, 2017. Data source: 182 questionnaires (respond "Yes" in Question A1 Are you employed at present) in 13 social housing communities in Guangzhou (n = 660), Question A15-A17 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

### 9.3.3.1 Main component analysis of selected variables

Similar to the two former regression analyses, we have added a factor analysis (method: PCA) before doing logistic regression on change in occupation and intention of change occupation. Variables entered in the factor analysis include all endogenous and employment variables, and the second group of perceived reasons. The rotation method used is “Varimax” and the extraction condition is the eigenvalue over 1. Results are shown in Tab.9.12, the analysis has extracted 12 dimensions with a 72.307% overall contribution rate. The columns display the extracted variables and the rows list the observed variables. Values marked in bold refer to the loadings over 0.4 on the extracted variable.

To see the columns for the extracted components, the first seven factors have high load values from several observed variables. For instance, the loadings of variables “A1 Employment status”, “A3 Employment contract”, “A4 The way of job participation”, “A18 Previous employment status”, “A7 Commuting mode”, “A8 Commuting time”, and “A9 Commuting cost” are -0.979, 0.979, 0.797, 0.679, 0.979, 0.979, 0.979 respectively. Because of the high load-values of these variables on the first dimension, it makes sense to explain the issue with one extracted factor rather than to use the original seven variables. Similarly, dimensions 2 to 7, and factor 10 will replace the original variables in further analyses. Dimension 8 has been marked with four variables that are over 0.4, however, they remain at a comparatively low level, and variable “I3 Age” has a marked value on both dimension 8 and dimension 11. This situation makes it difficult to use the compressed factor. Dimension 9 possesses three marked values, but it is difficult to find similarities among the variables included. In addition, dimensions 11 and 12 respectively comprise one variable with a high load value over 0.6. To select one extracted variable at a loss of explanation may reduce the accuracy in the following. Nevertheless, the observed variable “Location\_Cluster” and “A15A18\_5 Instinct features of the occupation” have not shown qualified weights on any extracted dimensions. Therefore, to avoid large mistakes or loss of information, this study also applied the original variables as the factors entered to do the regression.

In total, 19 independent variables were tested in following logistic regression research. To the eight extracted factors, another 11 original variables “I2 Gender”, “I3 Age”, “I5 Educational background”, “I4 Marital status”, “I12\_Re2 Household years in residence”, “City\_area1 Inner city location”, “Location\_Cluster”, “Dwellingtype” “I30\_Re6 Occupation”, “A15A18\_5 Instinct features of the occupation” and “A15A28\_6 Household restricts” were added and entered in the regression analysis directly. According to the characteristics of the compressed variables, eight extracted components were orderly renamed as “employment participation”, “household economic situation”, “insurance of employment”, “size of community”, “family size”, “for better working experience”, “moving-out pressure” and “living security”.

Tab. 9.12 Indicators of occupation change and eigenvalues, contribution rate and load-value matrix of extracted principle components

Indicators	Load-value of main components											
	1	2	3	4	5	6	7	8	9	10	11	12
I2_Re Gender-female	0.122	0.091	-0.034	-0.183	0.096	-0.085	0.085	-0.061	0.037	-0.102	<b>0.652</b>	-0.020
I3 Age	0.360	-0.072	-0.165	-0.101	0.173	-0.057	-0.128	<b>0.593</b>	0.099	0.108	<b>-0.462</b>	0.023
I5 Educational background	-0.167	0.394	0.262	-0.101	-0.147	0.075	0.205	<b>-0.441</b>	0.049	-0.003	0.215	0.223
I24 Pension	-0.010	0.228	0.185	-0.057	0.047	0.043	-0.038	0.140	0.055	<b>0.720</b>	-0.030	0.003
I25 Health insurance	-0.006	0.220	0.216	0.050	-0.050	0.029	0.056	-0.078	-0.015	<b>0.643</b>	-0.094	-0.067
I26 Unemployment insurance	-0.127	0.095	<b>0.856</b>	-0.020	0.007	0.062	0.057	-0.008	0.062	0.063	0.043	0.062
I27 Work-related injury insurance	-0.172	0.068	<b>0.809</b>	-0.044	0.073	0.028	0.044	-0.078	0.008	0.118	-0.006	0.017
I28 Housing fund	-0.191	0.134	<b>0.682</b>	0.062	0.018	-0.037	-0.094	-0.048	-0.045	0.151	0.013	-0.029
I29 Hardship subsidies	0.104	<b>-0.436</b>	0.361	-0.042	0.178	-0.113	-0.059	-0.142	-0.114	-0.264	-0.264	-0.036
I4 Marital status	0.070	0.044	-0.109	-0.190	0.046	-0.138	0.097	<b>0.736</b>	-0.057	-0.079	0.028	0.025
I18 Number of family member	-0.004	0.239	0.076	0.109	<b>0.855</b>	0.056	0.054	0.015	-0.032	0.051	0.255	0.010
I6_Re1 Number of child	-0.030	0.165	0.125	0.113	<b>0.512</b>	0.090	0.035	0.278	-0.064	0.110	0.471	0.095
I6_Re2 Number of elders	0.106	0.146	0.004	0.026	<b>0.839</b>	-0.030	0.032	0.039	-0.043	-0.037	-0.157	0.020
I11 Type of family	0.020	<b>0.623</b>	0.033	0.130	-0.019	-0.087	-0.079	-0.087	-0.067	0.067	0.090	0.073
I12_Re2 Household years in residence	-0.030	0.188	0.085	0.361	0.102	0.023	0.022	0.219	<b>-0.686</b>	0.053	-0.059	0.053
I14_Re Ownership	-0.102	<b>0.837</b>	0.025	0.197	0.084	-0.053	-0.142	0.001	0.039	0.048	0.017	0.070
I19 Rent	-0.100	<b>0.842</b>	0.022	0.201	0.111	-0.038	-0.132	0.010	0.038	0.084	0.027	0.068
I20_Re Facing moving-out pressure	-0.123	-0.131	-0.048	-0.010	0.058	-0.035	<b>0.859</b>	-0.007	-0.052	-0.024	-0.045	0.007
I20_Re2 Facing moving-out pressure caused by exceeded family income	0.024	-0.150	0.051	0.022	0.024	0.030	<b>0.827</b>	-0.002	0.022	0.044	0.150	-0.023
I31 Household income (monthly)	0.035	<b>0.761</b>	0.169	0.056	0.236	0.060	-0.001	-0.027	-0.065	0.116	-0.012	-0.197
I32 Household expenses (monthly)	0.037	<b>0.709</b>	0.201	-0.009	0.306	0.064	-0.041	-0.023	-0.037	0.082	0.001	-0.219
City_area1 Inner city location	0.134	0.169	0.104	0.351	-0.038	0.050	0.066	0.191	<b>0.511</b>	-0.341	-0.050	0.000
Location_Cluster	-0.218	-0.355	-0.125	-0.160	0.231	-0.057	0.025	-0.111	-0.111	0.421	0.113	0.121
Population of community	0.024	-0.269	0.024	<b>-0.905</b>	-0.095	0.068	-0.014	0.102	-0.026	0.007	0.052	0.015
Re_scale	0.015	0.227	-0.021	<b>0.913</b>	0.063	-0.062	-0.006	-0.086	0.081	-0.052	-0.066	-0.020
Dwellingtype	-0.026	0.014	0.026	0.210	-0.016	0.005	-0.041	0.080	<b>0.841</b>	0.119	0.008	0.066
A1 Employment status	<b>-0.979</b>	0.025	0.104	0.000	-0.018	0.124	0.023	-0.023	-0.021	0.015	0.003	0.030
A3 Employment contract	<b>0.979</b>	-0.025	-0.104	0.000	0.018	-0.124	-0.023	0.023	0.021	-0.015	-0.003	-0.030
A4 The way of job participation	<b>0.979</b>	-0.025	-0.104	0.000	0.018	-0.124	-0.023	0.023	0.021	-0.015	-0.003	-0.030
A18 Previous employment status	<b>0.679</b>	0.023	0.021	-0.006	0.019	0.273	0.014	0.129	-0.078	-0.088	0.066	0.243
I30_Re6 Occupation	0.093	0.342	-0.131	-0.154	0.071	0.002	0.107	<b>-0.487</b>	-0.180	-0.177	-0.331	-0.019
A7 Commuting mode	<b>0.979</b>	-0.025	-0.104	0.000	0.018	-0.124	-0.023	0.023	0.021	-0.015	-0.003	-0.030
A8 Commuting time	<b>0.979</b>	-0.025	-0.104	0.000	0.018	-0.124	-0.023	0.023	0.021	-0.015	-0.003	-0.030
A9 Commuting cost	<b>0.979</b>	-0.025	-0.104	0.000	0.018	-0.124	-0.023	0.023	0.021	-0.015	-0.003	-0.030
A15A28_1 For higher wage level	-0.258	-0.030	0.009	-0.028	0.073	<b>0.584</b>	-0.130	-0.028	-0.040	-0.110	0.143	-0.249
A15A28_2 For better social network	-0.070	-0.082	-0.048	-0.026	-0.014	<b>0.735</b>	-0.031	-0.064	0.087	0.085	-0.140	0.147
A15A28_34 Personal interests	-0.175	0.060	0.086	-0.059	0.006	<b>0.780</b>	0.119	-0.081	-0.049	0.041	-0.003	0.051
A15A28_5 Instinct features of the occupation	-0.183	0.014	-0.100	0.055	-0.109	0.153	-0.074	0.014	-0.153	-0.154	0.149	<b>-0.497</b>
A15A28_6 Household restricts	-0.151	-0.051	-0.029	0.022	-0.022	0.185	-0.087	0.013	-0.085	-0.146	0.119	<b>0.765</b>
Eigenvalues of main components	6.770	3.968	2.408	2.237	2.079	1.820	1.637	1.623	1.604	1.543	1.329	1.181
Contribution rate of main components (%)	17.359	10.173	6.175	5.736	5.330	4.667	4.199	4.161	4.113	3.958	3.409	3.027
Accumulative contribution rate of main components (%)	17.359	27.532	33.707	39.443	44.773	49.441	53.639	57.801	61.914	65.871	69.280	72.307

Note: Factor extraction analysis method: principal component analysis. Rotation method: Varimax with Kaiser normalization.

Source: own draft, 2017. Data source: Questionnaires administered in 13 social housing communities in Guangzhou (n = 660). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014. .

### 9.3.3.2 Logistic regression analysis on determinants of occupation change

This study simulates models for two dependent variables “occupation change” and “intention of changing occupation”. Like the above two regression analyses on job relocation, these two dependent variables are also binary variables with a value of 1 for yes and a value of 0 for no. The two regressions on occupation change include all endogenous variables and employment variables, and the second group “occupation” of “perceived reasons” (see Tab.9.7, “A15A28\_1” to “A15A28\_6”). There are three types of variables involved: scale variables, binary variables and nominal variables. Answers to the scale variables (e.g. “I3 age” and “I2\_Re2 household years in residence”) are real values coded, and the answers to binary variables are two valued categories “0” and “1”. These variables have been calculated in regression directly. As to nominal/categorical variables, using algorithm method “Indicator”, the study has redefined each sub-answer included as an independent indicator with binary answer “yes=1” and “no=0”. Variables that were dealt with in this way include “I4 marital status”, “City\_area1 Inner city location”, “Location\_Cluster”, “Dwellingtype” and “I30 occupation”. Nevertheless, since sub categories of “I5 Educational background” exhibit an ascending relationship among them, we reorganized them with the algorithm method “Difference”. As mentioned, logistic regressions contain six testing methods to build up models: Forward-Conditional, Forward-LR (Likelihood-Ratio), Forward-Wald, Backward-Conditional, Backward-LR and Backward-Wald. In view of these calculation method, this study selects Forward-Conditional and Backward-Conditional to formulate models, then to decide the final formulation based on fit percentage.

#### Determinants of occurred occupational change

This regression aims to find the determinants of occupational change behaviour among respondents after resettlement in social housing communities. The dependent variable is “A11\_Re2”, which was generated based on the survey question “A11 How did you change your job?”. The included answer 2) and 3) represent the occurrence of occupational change; these two have been merged into a new category “yes” in variable “A11\_Re2”. In the same way, answer 1) and 4) of “A11” regrouped into answer “no” in variable “A11\_Re2”. As a result, the dependent variable is a dummy one that refers to the occurrence of occupational change. Two models in Tab.9.13 show the results of Forward-Conditional and Backward-Conditional respectively. After four steps of selection, model 1 explains the issue in 95.0% with four variables “FAC1 Employment participation”, “FAC6 For better working experience”, “I2 Female” and “A15A28\_6 Being affected by household restrictions” (see Tab.9.13).

**Tab. 9.13 Logistic regression models for the determinants of occupational change**

Variables in the Equation		Model 1 (Model fit = 95.0%)					Model 2 (Model fit = 95.6%)				
Code	Name	Test methods: Forwards-Conditional, stopped at step 4					Test methods: Backward-Conditional, stopped at step 15				
		Coefficient	P-value	OR	95% CI (n=660)		Coefficient	P-value	OR	95% CI (n=660)	
					Lower	Upper				Lower	Upper
FAC1	Employment participation	-1.368	0.002	0.255	0.107	0.607	-1.417	0.002	0.242	0.098	0.597
FAC6	For better working experience	1.032	0.000	2.808	1.983	3.976	1.040	0.000	2.829	1.994	4.014
I2	Female	1.880	0.009	6.555	1.615	26.611	1.833	0.011	6.254	1.526	25.628
A15A28_6	Being affected by household restrictions	2.624	0.009	13.789	1.918	99.154	2.836	0.005	17.041	2.346	123.758
FAC7	Moving-out pressure						0.300	0.084	1.350	0.960	1.898
	<b>Constant</b>	-5.404	0.000	0.030			-5.489	0.000	0.004		

Note: Dependent variable: A11\_Re2: Regrouped A11 Have you changed the type of work? Probability of stepwise, enter <= 0.050, remove >= 0.100). CI refers to the confidence interval, and OR refers to the odds ratio.

Source: own draft, 2017. Data source: Questionnaires in 13 social housing communities in Guangzhou (n = 660). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

The fit percentage of model 2 reached 95.6%, the Backward-Conditional methods took place 15 steps to find the five factors as determinants. Adding to the four determinants of model 1, “FAC7 Moving-out pressure” has entered the formulation as well. With reference to the p-values of every determinant, in both models the first four present are below “0.05”. The p-value of “FAC7” is 0.084, which is slightly higher than the 0.05 significance. However, the logistic regression may select important and insignificant variables to improve the model’s explanatory strength. Therefore, our study opted for model 2 as the final equation:

**Occupational change** = - 5.489 – 1.417 · Employment participation + 1.040 · For better working experience + 1.833 · Female + 2.836 · Household restriction + 0.300 · Moving-out pressure

Both coefficient and OR (Odd-Ratios) can describe the correlations between the independent variables and the dependent variable. Minus value in a coefficient means a negative correlation while a positive number refers to positive correlations. An OR below 1 implies a negative relationship and over 1 means positive effects. The first factor “employment participation” presents a negative effect on occupational change. Its coefficient is -1.368 and OR is 0.255, which indicates that people who keep performing in the labour market may have a lower occurrence of changing occupations after resettling in a new location. In contrast, those who have unstable participation in the labour market may change jobs more frequently. The more stable and the longer participation in the job, the lower the probability of changing occupations. The second selected indicator, “for better working experience”, shows a positive effect on the dependent variable in the model. Its coefficient is 1.040 and OR value is 2.829, which displays a weak positive correlation with occupational change behaviour. In this study, “better working experience” includes the three dimensions, higher wage level, better social network and stronger personal interest in target occupation. The result implies that resettled people may change their occupations because of better working experience. “Gender-female” is confirmed as a positive indicator, whose coefficient is 1.833 and OR value is 6.254. Two values indicate strong correlations between the gender and occupational change behaviour. Females display much higher variation than males in occupation, in other words, females may have greater flexibility in their occupations than males after moving into social housing. Generally, females’ job participation may tend to be more affected than males’ by the household restrictions in a family. The next indicator entered “being affected by household restriction” confirmed this thinking with a coefficient of 2.836 and OR of 17.041. This factor acts as the strongest positive effect in the model. It refers to people who may change jobs in consideration of their household situations (e.g. caring of children or the elderly). A positive correlation indicates that more household restrictions may lead to greater change in people’s occupations. Since household restrictions are closely linked to females, particularly among households with limited income levels, the positive effects of the above two factors provide evidence of the impact on the household and females, and further on their occupational participation. Furthermore, coefficient 0.300 and the OR value 1.350 of “moving-out pressure” indicate a weakly positive correlation to occupational change. That is to say, residents who have a long time in social housing may continue to exert effort in their current jobs, while people who are going to leave social housing communities demonstrate higher variability in occupation. In essence, the moving out requirement commonly affects households whose income level exceeds the low-income standard. Therefore, people in lower income families (e.g. low-income family) show fewer changes in occupation than families with higher income level.

### **Determinants of intended occupational change**

In order to find out the reasons that may have an effect on people’s intentions to change occupation, this study makes use of logistic regression to define the determinants of 19 prepared variables (8 extracted variables and 11 original variables, refer to the results in 9.3.3.1) for dependent variable “A27 Do you intend to change the type of work”. Since the survey only required employed people to respond with “yes” or “no”, in total 182 cases were included in the logistic regression. For the purpose of simulating a better model, the study respectively selected Forward-Conditional and Backward-Conditional as the testing approaches. As shown in Tab.9.14, Forward-Conditional stopped at step 4 and four variables were entered, Backward-Conditional has selected nine variables with the 14-step test. However, in Model 2 more variables display p-values over 0.05. As more insignificant variables will not improve the model fit (both models display a 91.7% fit percentage), we draw on the simple Model 1, see equation below:

Tab. 9.14 Logistic regression models for determinants of the intention to change occupations

Variables in the Equation		Model 1 (Model fit = 91.7%)					Model 2 (Model fit = 91.7%)				
Code	Name	Test methods: Forward-Conditional, stopped at step 4					Test methods: Backward-Conditional, stopped at step 14				
		Coefficient	P-value	OR	95% CI (n=182)		Coefficient	P-value	OR	95% CI (n=182)	
Lower	Upper				Lower	Upper					
FAC1	Employment participation	-10.435	0.000	0.000	0.000	0.007	-12.958	0.000	0.242	0.000	0.001
FAC2	Household economic situation	1.136	0.015	3.113	1.249	7.762	1.032	0.036	2.806	1.072	7.344
FAC6	For better working experience	2.147	0.000	8.558	3.598	20.351	2.684	0.000	14.645	4.918	43.611
FAC7	Moving-out pressure	-1.996	0.083	0.136	0.014	1.298	-1.870	0.081	0.154	0.019	1.258
	Location of community: cluster							0.133			
	Location of community: cluster(1) western cluster						3.152	0.027	23.382	1.443	378.945
	Location of community: cluster(2) middle cluster						-0.533	0.651	0.587	0.059	5.891
	Location of community: cluster(3) eastern cluster						0.425	0.634	1.530	0.265	8.824
	Mixed type							0.079			
	Mixed type (1) LRH, EAH & ANJU						1.526	0.186	4.598	0.479	44.129
	Mixed type (2) LRH & EAH						-0.722	0.587	0.486	0.036	6.576
	<b>Constant</b>	<b>-15.395</b>	<b>0.000</b>	<b>0.000</b>			<b>-19.624</b>	<b>0.000</b>	<b>0.000</b>		

Note: Dependent variable: A27 Do you intend to change the type of work? Probability of stepwise, enter  $\leq 0.050$ , remove  $\geq 0.100$ . CI refers to confidence interval, and OR refers to odds ratio.

Source: own draft, Oct, 2017. Data source: 182 questionnaires (respond “Yes” in Question A1 Are you employed at present) In 13 social housing communities in Guangzhou (n = 660), Question A12-A14 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Intention to change occupation = - 15.395 – 10.435 · Employment participation + 1.136 · Household economic situation + 2.147 · For better working experience – 1.996 · Moving-out pressure**

Firstly, “employment participation” is an important factor that has a negative impact on willingness to change occupation. The coefficient is -10.435 and the OR is 0.000 which indicate a very strong and negative link between “employment participation” and the intention to change occupation. That is to say, people with a stable working situation may have less desire to change their occupations than those with unstable jobs or with unsustainable working experiences. Flexible working situations may strengthen people’s intentions to find a new occupation after moving into a social housing community, but secured working conditions may mean people are less likely influenced. The second variable entered is “household economic situation”, which indicates a medium positive effect with a 1.136 coefficient and a 3.113 OR value. The result implies a better household economic situation may drive surveyed workers to make changes in their occupations in the near future. Conversely, lower family income levels may limit members’ intentions to find a new occupation. In essence, household economic conditions have close links with family members’ work ability. Therefore, lower economic levels may reflect a lack of working ability and a narrow occupational sphere, which further weakens people’s intentions to change occupation. The coefficient of “for better working experience” is 2.147 and the OR is 8.558. The fact that the OR value vastly exceeds “4” demonstrates that the positive effect of this indicator on the dependent variable is quite strong. The factor was extracted by main component analysis and contains three indexes: higher wage level, better social network, and stronger personal interests towards new occupation (see Tab.9.12). The results reveal that the desires of people to take on a new occupation may increase with working experience. The last determinant, “moving-out pressure”, has a medium negative effect with a coefficient of -1.996 and an OR of 0.136. The effect shows that people who are required to move out of social housing may have negative aspirations for occupational change. By contrast, those people who qualify to stay for a longer time present stronger intentions to search for a new occupation.

### Sub-conclusion

In analysing occupational changes, this study has made use of two statistical methods to seek potential effects. The first one is the radar chart, a descriptive statistical analysis, to visualize the direct responses to the survey question concerning reasons for seeking a new occupation. The second approach is logistic regression, which is applied to test more variables (e.g. variables about employment, individuals and household). The main results are summarized in Tab.9.15, in which the first column shows the strength of effects on the people who have changed occupations after moving into social housing, while the second column displays the effects on the people who have intentions to find a new occupation. Drawn from Tab.9.15, occupational change is closely associated with employment participation and the attractiveness of the occupation. Both change behaviour among people who have changed occupation and those who intend to do may be influenced by the stability of employment, income level of occupation, social networks and personal interests. In addition, gender, household restrictions, household economic situation and moving-out pressure may affect people's behaviour to different degrees.

**Tab. 9.15 Effects of occupational change behaviour on social housing residents**

Factors		Dependent variables	
		Correlation	
		Occurred occupational change <sup>a</sup>	Intention of change occupation <sup>b</sup>
Employment	Employment participation	Weak negative (-1.147)	Strong negative (-10.435)
	Contract (stability) (see Fig.9.8)		
	Continuous participation	Medium positive (1.040) Strong Weak Strong	Medium positive (2.147) Medium Weak Strong
	For better work experiences <sup>d</sup>		
Higher salary (see Fig.9.8)			
Better social network (see Fig.9.8)			
	Personal interests (see Fig.9.8)		
Household	Gender-female	Medium positive (1.833)	
	Household restrictions	Medium positive (2.836)	
	Family restriction	Weak	
	Household economic situation		Medium positive (1.136)
	Moving-out pressure	Weak positive (0.300)	Medium negative (-1.996)

Note: <sup>a</sup> The data (coefficients of factors) in this column are a result of Tab.9.13. <sup>b</sup> The data (coefficients of factors) in the column are taken from Tab.9.14. <sup>c</sup> The indicator "for better work experience" is the sixth factor extracted by the factor analysis (see Tab.9.12), which comprises three original variables "for higher wage level", "for better social network" and "personal interests". Source: own draft, July 2018.

1) Employment participation may reduce the occurrence of occupational change and particularly weaken people's desires for a new occupation. As displayed in Tab.9.15, employment participation presents a -1.147 correlation with occurred occupational change. The negative effect of this factor rises to -10.435 with the intention of occupational change. Firstly, it reveals that the more stable the job, the less possibility and the less intention there is to change occupations. Secondly, it implies high stability of the job and persistent participation in employment may greatly decrease people's desire of seeking a new occupation. In contrast, unstable employment may result in flexible participation in an occupation.

2) Better working experience produces significant and positive effect on occupational change. This factor has a medium positive effect either on people who have changed occupation or on people who have plans to do so. The correlations are 1.040 and 2.147 respectively. The two positive values may indicate that better working experience is a lasting attraction rather a temporary one and its effects may increase with time. The indicator contains three sub-indexes: higher salary, better social network and personal interests. In addition, the radar chart (see Fig.9.8) demonstrates the effects of these three factors, "higher salary" and "personal interests" have strong links to occupational change while the "better social network" works weakly.

3) Gender-female only shows a positive link with the occurred behaviour, but has no significant correlation with future intentions. The result may indicate that moving into social housing may produce stronger effects on women's occupation than on men's. Females may thus have a higher possibility of changing their occupation to some extent. However, gender is no longer an effect in intention to change occupation, that is to say, there is no significant difference between male and female regarding desire to change occupation, but resettlement may have strong effect on females' occupational changes.



4) Household restriction produces a positive effect on people’s occupational change behaviour after resettlement. Like the third factor “gender-female”, household restriction is no longer selected as having a significant influence on future intentions with respect to occupational change. This result indicates that people who experience pressures from the household tend to change their original occupations after resettling in social housing communities. However, this effect is seemingly more effective in the short-term after moving residence, and has very little impact on people’s further intentions. At the same time, the radar chart also confirmed the different correlations with the two categories (i.e. occurred occupational change, and intention of occupational change).

5) Household economic conditions may only affect individuals’ intentions to change occupation. The coefficient of 1.136 means the higher family income may contribute to stronger aspirations towards a new occupation. By contrast, people from household with lower economic conditions indicate a weaker willingness to change occupations. They may prefer to perform in a fixed occupation for longer.

6) Moving-out pressure acts as a very weak and positive force on people’s occupational change, but produces much strong and negative forces on people’s intentions. Moving-out pressure is linked to the household income level; when this surpasses the standard level, the family may get pressure to move out of social housing. This situation only exists among households in low-income rental housing. Therefore, this negative correlation implies that people in low-income families may reduce their intentions to take part in other occupations when their incomes exceed the standard level. In other words, a household income lower than the standard level, which is not accompanied by any moving-out pressure, may result in members having greater intentions to take on various occupations.

## 9.4 Conclusion

In Tab.9.16, we have summarized the findings of the above analyses. The job–housing relationship was tested along two dimensions: spatial matching and occupational matching. The study in this chapter firstly determined the geographical features between the workplace and the residential area of the targeted group after moving into new living places. Then the features of the occupational environment around their living areas were identified to find out whether suitable job opportunities are accessible. The next step aimed to identify the possible effects that may lead to changes in the job–housing relationship, either in terms of the workplace or the occupation. By way of statistical analyses, selected determinants have been listed in Tab.9.16. In the following section we elaborate successively on the features of the spatial connection between the workplace and housing, occupational environment, and determinants.

Firstly, the relocation of residence results in an employment re-concentration process; previous employment concentration in the city centre area has been replaced by residence-centric aggregation. Simultaneously, the employment distribution shows a polarising trend where the ratio of jobs close to residence and jobs far from the residence has increased, while the ratio of jobs at a medium-distance from home have decreases. This change is closely linked to long distances and inconvenient transportation between work and residence caused by moving into social housing. Residents in distant communities indicated disadvantages in the job–housing match compared to people in other communities. This was deduced from their higher commuting costs and longer commuting times. From these outcomes, we find that the resettlement of low-income families in social housing communities greatly influences people’s behaviour in regard to the new job–housing spatial connections. Social housing situated in periphery not only results in higher costs on commuting and longer commuting time, in particular in inconvenience for the employees with stable and ideal jobs, but also drives people to seek new jobs nearer residential area instead of jobs located closer to the city.

As to the occupations of social housing residents, they are mostly situated in places that are surrounded by commercial services and residential services, and their participation in those low-skilled occupations is positively linked to local occupational level. In contrast to relocation behaviour, difficulty commuting or lack of spatial connections presents no significant effects on changes in occupation. Occupational change behaviour appears to be closely linked to individual and household determinants (e.g. personal working experiences, household economic situation, moving-out pressure and gender) rather than geographical features.

To explore the effects that moving into social housing have on people's behaviour or intention to change workplaces or jobs, this study has made use of two methods. One is the direct request for reasons in the questionnaire, the results of which are demonstrated by the radar analysis. The other is logistic regression analysis, in which more attributes such as household income level, education, gender etc. were jointly tested. The combined results are displayed in the column "direct factors" and the column "potential factors" in Tab.9.16. As shown in the above analyses, spatial change of workplaces and occupational change were discussed separately, and in each, the occurred changes and intentions to change were seemingly independently studied. To obtain a view of all the extracted effects of four categories, we can conclude the outcomes as the following:

1) The stability of jobs always strongly and negatively affects any changes in people's employment. In terms of the determinants of the four regression research, there is a notable finding, that is, that participation in employment may restrict the possibility of any changes, either in location or occupation. Taking part in a job position for a long time reflects the comparatively high stability of current work. As seen in Tab.9.16, "employment participation" always acts as a prominent force that negatively correlates with workplace relocation, occupational change, and any upcoming plans about job changes. This generally means that no matter how far the distance to the workplace increases as a result of the new living location, a stable and guaranteed job opportunity will reduce possible changes in jobs. The surveyed people may tolerate longer distances and a worse commuting situation after moving into social housing, rather than replacing their job with a new job that is spatially proximate. Similarly, regarding the negative impact of work on occupational change, a steady work opportunity greatly reduces the desire to undertake a new type of job.

2) Moving into social housing may increase the occurrence of work relocation. To see the main positive determinants in the grid "direct factor" (Tab.9.16), two main influences are long distance between workplace and residence and inconvenient spatial connection. After people are resettled in remote social housing community, the majority have to confront a longer spatial distance between the workplace and housing and need to handle inconvenient commuting connections. The spatial difficulties involved in accessing the job really increase the fact of finding a new workplace. Some surveyed workers have tried to solve their spatial mismatches caused by housing resettlement in this way. Workplace relocation among social housing residents is mainly impelled by spatial connections between jobs and housing.

3) Changing to a new occupation may be largely related to the work environment and individual features. The main positive determinants shown in the "direct factor" about occupational matching are socially related attributes. Higher wage levels, better social networks and stronger personal interests increase the occurrence of searching for a new occupation. Simultaneously, females and people who shoulder more family responsibilities may be more likely to change their occupations than others. In terms of the effects, we know that moving into social housing, i.e. residential relocation, has not created notable effects on occupational change. The results reveal that occupational change is very different to spatial changes, which is mainly influenced by social causes such as working experiences, gender and household restriction rather than any spatial effects.

4) Intention to change workplace or change occupation is strongly and positively linked to better working experiences. With respect to the effects of aspirations, spatial factors no longer work as notable forces but several social factors do. For both people who have plans to seek a job in a new place and people who desire to participate in a new occupation, the better working environment in target jobs functions significantly positively to strengthen their intentions.

5) Moving-out pressure may reduce surveyed workers' intentions about changing workplace and occupation, while household economic situation produces positive effects. Both intentions for location change and occupational change demonstrate significant associations with several social aspects such as moving-out pressure and household economic situation. As indicated in Tab.9.16, moving-out pressure functions as a negative force while household economic situation works as a positive effect. Improved economic level may increase people's expectations of a new job or a new workplace, and lower economic levels make people think less about taking up a new occupation or in a new place. Moving-out pressure affects people's lives in low-rental housing because when their income level surpasses an upper limit they may experience pressure from managers to leave social housing. People who experience this pressure may reduce their intentions to make any job changes. In addition, gender-female is negatively linked to intention to seeking a new job, that is to say, females show lower intentions towards job mobility than males.

To conclude the discussion on features of job–housing spatial matching and occupational matching, we find the distance and transport connections between job and housing may greatly influence residents' workplaces. Personal perceptions on occupation, a better economic situation, being female and unguaranteed residential admission may raise occupational variability. New residences provide higher density of proximate occupations for low-skilled services like commercial and residential service, which may attract social housing residents to perform in this labour market. That is to say, the employment situation among social housing residents can be greatly improved by proximate opportunities in lower-skilled occupations. By contrast, residents in social housing are not spatially isolated from job opportunities of the high-skilled labour market, but they do have a weak spatial connection to them. This illustrates that employment among social housing residents is not only a result of the local employment environment but also of individual choice.

Tab. 9.16 Conclusions on the determinants of the job–housing relationship after moving into social housing

	Distribution of employments	Change in commuting	Direct factors	Potential factors
<b>Spatial matching</b>	<ul style="list-style-type: none"> <li>- An employment decentralization process in the city centre</li> <li>- Classification of employment areas of residents in different communities</li> </ul>	<ul style="list-style-type: none"> <li>- New employment structure</li> <li>- Higher concentration of local employment. Decrease in medium-distance employment. Slight increase in distant employment</li> <li>- In general, commuting costs increased.</li> <li>- Residents in distant communities present more obvious increases in commuting time and costs, particularly those in the eastern cluster and the northern cluster</li> </ul>	<p><b>Main positive determinants:</b></p> <ul style="list-style-type: none"> <li>- Long distance between work and residence</li> <li>- Inconvenient spatial connection between job and workplace</li> </ul> <p><b>Main negative determinants:</b></p> <ul style="list-style-type: none"> <li>- Employment participation</li> <li>- Stable employment may reduce job mobility</li> </ul> <p><b>Other effects:</b></p> <ul style="list-style-type: none"> <li>- Pleasant work experiences (positive)</li> <li>- Higher wage levels, better social networks</li> </ul>	<p><b>Main positive determinants:</b></p> <ul style="list-style-type: none"> <li>- Pleasant working experiences (e.g. higher wage levels, better social networks, stronger personal interests)</li> </ul> <p><b>Main negative determinants:</b></p> <ul style="list-style-type: none"> <li>- Employment participation</li> <li>- Stable employment may decrease job mobility</li> <li>- Moving-out pressure</li> </ul> <p>People who are required to move out of social housing may make fewer decisions to change workplace.</p> <ul style="list-style-type: none"> <li>- Gender-female</li> <li>- Male residents present stronger aspirations than females on changing workplace</li> </ul> <p><b>Other effects:</b></p> <ul style="list-style-type: none"> <li>- Inconvenient spatial connection between job and housing (positive)</li> <li>- Household economic situation (positive)</li> <li>- Living security (negative)</li> </ul> <p>People with guaranteed social security (low-income subsidies) may decrease intentions regarding job mobility</p> <ul style="list-style-type: none"> <li>- Occupation (positive)</li> <li>- Administrative jobs (strong); commercial jobs (strong); educational jobs (intermediate), basic services jobs (weak); secondary jobs (weak)</li> <li>- Service industry rarely restrains people's workplaces</li> </ul>
<b>Occupational matching</b>	<p><b>Occupational level of residence</b></p> <ul style="list-style-type: none"> <li>- Located in the centre of commercial and residential services</li> <li>- Higher possibility of contacting people with similar occupation</li> </ul>	<p><b>Changes on occupation</b></p> <ul style="list-style-type: none"> <li>- Occupational structure</li> <li>- Aspiration to change workplace is higher than aspiration to change type of work</li> <li>- Residents in more developed communities are more actively to change works</li> </ul>	<p><b>Main positive determinants:</b></p> <ul style="list-style-type: none"> <li>- Pleasant working experiences (e.g. higher wage level, better social network, stronger personal interests)</li> <li>- Gender-female</li> <li>- Females change occupations more frequently than males</li> <li>- Household restrictions</li> <li>- People whose employment behaviour is influenced by family responsibilities may find it easier to change occupation</li> </ul> <p><b>Main negative determinants:</b></p> <ul style="list-style-type: none"> <li>- Employment participation</li> <li>- Stable employment may decrease occupational change</li> </ul> <p><b>Other effects:</b></p> <ul style="list-style-type: none"> <li>- Moving-out pressure (weak positive)</li> </ul>	<p><b>Potential factors</b></p> <p><b>Main positive determinants:</b></p> <ul style="list-style-type: none"> <li>- Pleasant working experiences (e.g. higher wage level, better social network, stronger personal interests)</li> </ul> <p><b>Main negative determinants:</b></p> <ul style="list-style-type: none"> <li>- Employment participation</li> <li>- Unstable employment may contribute to a stronger desire to change occupation</li> </ul> <p><b>Other effects:</b></p> <ul style="list-style-type: none"> <li>- Household economic situation (positive)</li> <li>- a better household economic situation may lead to possible changes in occupation in the future</li> <li>- Moving-out pressure (negative)</li> </ul> <p>People who are pressure to move out may have fewer aspirations to change their occupation</p>

Source: own draft, Oct, 2017

## 10 Integration theory at neighbourhood level

### Spatial justice at neighbourhood level – survey-based analysis

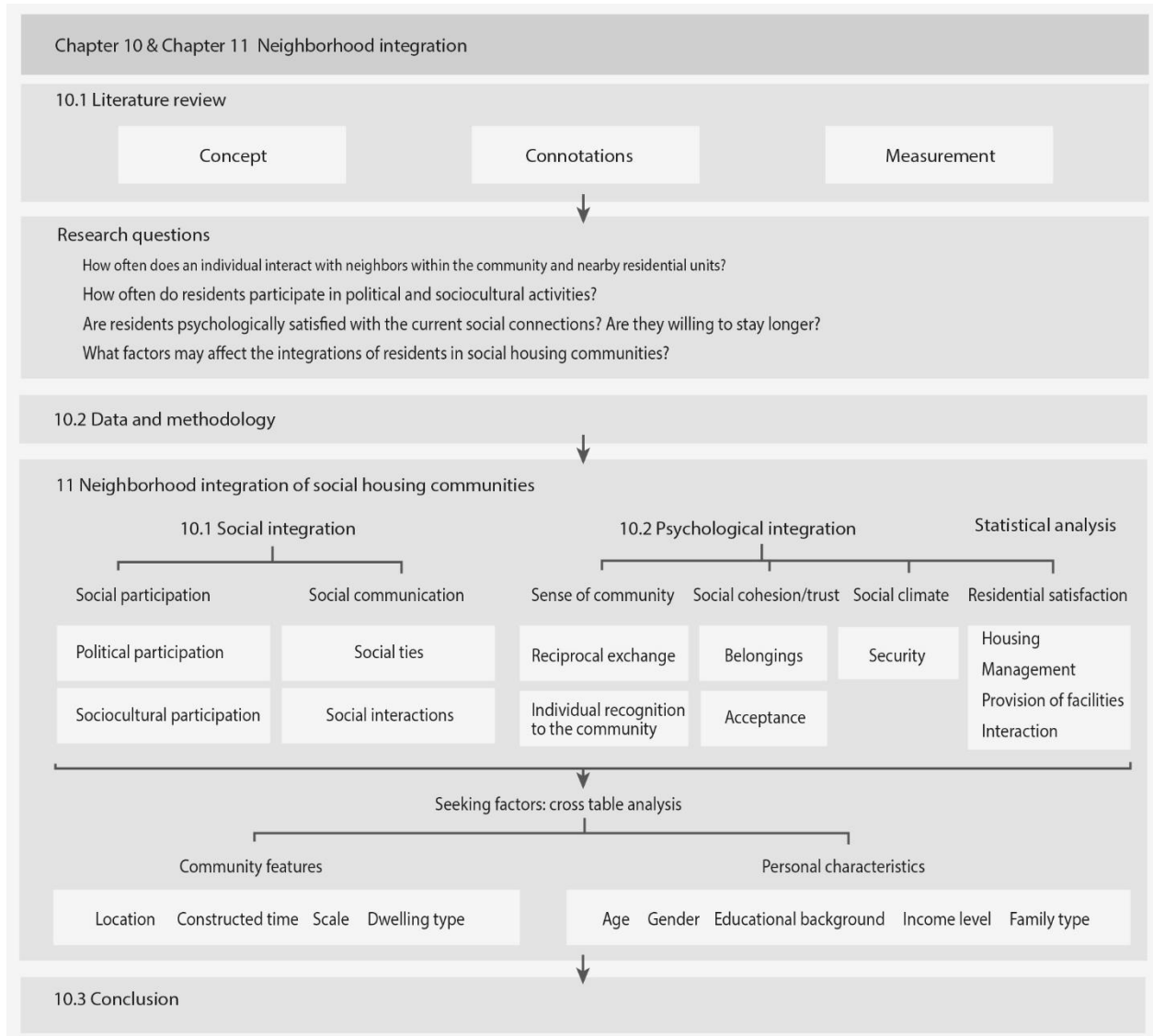


Fig. 10.1 Outline of Chapters 10 and 11: neighbourhood integration

Source: own draft, 2019.

## 10.1 literature review on the structure of neighbourhood integration

### 10.1.1 Community and neighbourhood

Similarities in the terms “community” and “neighbourhood” have not been largely discussed and identified in depth on their definitions, which has led to their misuse in a number of studies. Due to the specificity of our dwelling units, the targeted group is closely linked to the institutional system; hence, one should be cautious when using the term “community” and in regard to extended issues related to integration and cohesion. In review studies on the distinctions between “community” and “neighbourhood”, the origin, connotation and terminological misuse in related research have been concluded and argued in detail by Cummins and Kim (2015) and Chaskin (1997). Their work has thus shed light on the precise use of the two terms in our study.

### 10.1.1.1 Distinctions between the definitions of “community” and “neighbourhood”

In essence, “community” is a concept that contains meanings in both geographical and institutional areas. In *The Social Construction of Communities*, Suttles (1972) suggests that a community should encompass boundaries, reputations and identities, and be regarded as a biological system which contains territoriality and human behaviour (Howton, 1975; Ley, 1974). A more structured definition is stated by Gusfield (1975), who states that the term “community” has two main uses, the first is the territorial and geographical notion of neighbourhood, town and city, and the second is the “relational” which is concerned with human relationships rather than location.

Differ from these explanations, several researchers have addressed more social features to define “community”. Durkheim (1964) finds that community is subject to be developed in relation to the idea of “interests” and “skills” rather than to the idea of “locality”. In the sense of society, it can be regarded as a smaller portion of society (Berman and Phillips, 2000), an objective ecological domain between the individual and society (on the scale of individual, partner, family, community and societal levels). The definition of Merriam-Webster (2014) emphasizes the common interests, shared beliefs, or shared policy among individuals within the community and researchers are concerned with the ties between members regarding interdependency, connectedness and belonging (Sarason, 1977). McMillan and Chavis (1986) have proposed that, “community” is a notion with a geographical meaning in terms of location and size which can be used to describe dwelling units comprised of groups with a common interests. In other words, place-based communities can equally be regarded as a neighbourhood from a territorial angle. To conclude, “community” implies more than simply a geographical place with numbers of residents, but implies a connection in which some combination of beliefs, priorities and concerns among members exist (Chaskin, 1997).

Implicit information of “community”. This is a positive entity where mutual beneficial relationships are formed. As stated, the term “community” seems ambiguous, implying belonging (affective connection) and intimate ties rather than a simple instrumental function or casual relations among neighbours (Chaskin, 2013). Nevertheless, the development of community is commonly accompanied by facilitating actions to promote local connections within residential units. Several inappropriate applications of “community” are represented by descriptions on dwellings of intellectual disability with prejudice or negative implications. It is more reliable to understand the term with reference to low-income communities where people are more dependent on one another. Owing to socially homogeneous neighbours, these residents would bond more closely with one another but keep their distance from outsiders (Piliisuk and Froland, 1978). To understand in this, it is more suitable to view the community as a collective in which each member’s well-being is associated with the fate of the unit (Rossi, 1972).

In comparison, the related term “neighbourhood” is used to describe a spatial construction where people live proximately (Chaskin, 1997). Although both “community” and “neighbourhood” are geographical units with social attributes (e.g. social connections – friends, relatives; functional connections – production, consumption; cultural connections – religion, ethnic identity; and circumstantial connections – economic status or lifestyle), “neighbourhood” accentuates more the shared proximity and the circumstances that come with it. Hallman (1984) explains a neighbourhood as a limited territory within a larger city area. There are several extreme examples to define “neighbourhood”, such as a 150,000 residents in a geographic area, districts with half a million population (Cheng and Wang, 2013), or the whole street (Bates and Davis, 2004). A neighbourhood contains detached houses and social structures, but is not characterized by interdependent social networks or clearly excluded cohesion. Therefore, a neighbourhood shows less positive and weaker institutional links, which is more similar to adjacent residential units with inconsistent and complex characteristics (Barlow and Kirby, 1991). In conclusion, the main feature of community is homogenous residents with aspect which may contribute to a closer internal social network and common sense of purpose, the distinct character of a neighbourhood is the one that subjects to an adjacent unit of more heterogeneous residents without shared interests or noticeable exclusion situations. A neighbourhood is a socially constructed concept, a spatial entity with physical boundaries. It may consist by buildings, streets, parks, water system and official boundaries.

### 10.1.1.2 Application of the terms “community” and “neighbourhood”

There is an obviously a close institutional link among our target dwelling units, which are built with government assistance in terms of capital and for the well-being of individuals. To identify these target units from aspects of the economy, they tend to be located in the suburbs and be settlements concentrated on low- and middle-income citizens.

The common characteristic of the population included is a weak level of social capital in compared with the majority of citizens. In spite of not being fully convinced about using “community” before doing reliable tests on the consistency of group’s sense, perception or ideology, or clarifying the postulated strong interdependence among them, it is still rational to select “community” rather than “neighbourhood” to identify our research units. Features like institutional links, similar weak economic ability and welfare attributes, have provided rich evidence of a cognitively functioning community. The targeted units focus on the local neighbourhood environment, community functioning, and shared interests. In the following sections, this study focuses on identifying distinctions among social networks inside and outside the community, to understand whether they are a real or an ideal “community” as identified (powerful, positive, superior form of accommodation than others). The implicit positivity of the term “community”, which leads to its expanded use in academic studies, involves more dimensions than the extensive use of the term “neighbourhood”. Recently, the process of homogeneous concentration of poor ethnic groups or immigrants in urban residential areas has led to them experiencing less mobile and more isolated circumstances than other urban groups. Therefore, as arguments around a decline in community and its positive or negative effects have indicated, there is limited liability, a low density of acquaintanceship and decreasing residential attachment.

## 10.1.2 Integration concepts at macro level

### 10.1.2.1 Concept: social cohesion

Social cohesion is frequently used in academic analyses and policy discourses. Efforts to define the term and operationalise it in the literature have been initiated by the demands of policymakers and policy-oriented analysts (Chan et al., 2006). Talk of “cohesion” in the political arena is largely related to the concrete phenomenon of social cleavages reacting to causes and effects directly. This problem-oriented logistic appears to lack a clear and operational theoretical structure. Because of the analogous meaning in ideas of social integration and system integration, and the extended misuse in similar issues, confusion has appeared in the theoretical area. As suggested, the origin of “social cohesion” in modern sociology can be traced back to Emile Durkheim (Pahl, 1991). Once, the concept of cohesion acted as a critical position in macro-sociology (Bollen and Hoyle, 1990). However, early studies provided few implications with respect to the term’s explicit definition and operationalization. Even in the work of Gough and Olofsson (1999), they are linked to the issue to social integration and social exclusion.

After a period in which studies from the perspective of social psychology were prevalent, abundant discussions were raised around topics such as the relationship between cohesion and mental pressure and suicide (Durkheim, 1964; Bakeman and Helmreich, 1975; Festinger et al, 1952). And in the following, several researchers attempted to conceptualize and measure cohesion constructs from the end of the 1980s.

In general, social cohesion refers to a social bond that supports neighbours in working together to attain a shared goal, particularly in a stable, favourable environment (Sturgis, 2014). In a study on the impacts of ethnic diversity on social cohesion in London, Sturgis et al. (2014) regarded meaningful social contacts as the dimension for evaluating social cohesion. The study assumed that the more meaningful the contact is, the greater the intimacy and the higher the trust between people is. Three questions were selected to measure what social cohesion is: being trusted, acting with courtesy and being proud of their environment.

Another conceptualization of social cohesion is based on the idea “collective”; this was formulated in and applied to neighbourhoods’ social issues. In a study on neighbourhood crime, by mainly attending to the connotations of a socially cohesive neighbourhood, Sampson et al. (1997) generated a context of collective efficacy to define the relationships of mutual trust and willingness to engage with the common good within a neighbourhood. The premise of collective efficacy based on the willingness to intervene in the common good relies mainly on mutual trust and solidarity between social connections. Therefore, five questions were selected to account for social cohesion: willingness to help neighbours, close-knit neighbourhood, neighbours can be trusted, comfortable connections with neighbours and neighbours sharing the same values. In fact, the five aspects explicate individuals’ assessments and perceptions of communication, emotional connection and common values within neighbourhoods. Here collective efficacy refers to psychological integration here, rather than to social cohesion generally rather than in detail. The above efforts helped to clarify and redefine the term from its original rather confused context. There are many notable works that have elaborated on the dimensions and connotations of the term “social cohesion”.



### Dimensions of social cohesion

*Perceived cohesion and objective cohesion.* In addition to those denotations of the social cohesion paradigm, several other fundamental contributions are worthy of notice, such as the two dimensions, objective and perceived, which were suggested by Bollen and Hoyle (1990). The dimensions apply to relationships between perceived cohesion and objective cohesion. According to the interpretation, perceived cohesion contains individuals' sense of belonging to a group and feelings of morale associated with membership in the group. Because the two dimensions comprise both cognitive processing and affective processing, they provide both information and motivation to members. In this construct, individuals' perceptions of their own experience within the group are explicitly stressed. However, a point worthy of note is that sense of belonging in perceived cohesion is not equal to the synonym "group identification". The latter term contains an abstract inference of a belief or an ideology, which is beyond the range of "sense of belonging" (Bollen and Hoyle, 1990). Connotations of belonging include elements like being a part of a group, group satisfaction, and anticipated need satisfaction. Simultaneously, a feeling of morale refers to emotional responses to affective processes. The theoretical efforts which are widely referenced have provided a big step forward for empirical studies by proposing six operational questions to respond to the meanings of the two dimensions. With data from the two random samples on university and city, on which a confirmatory factor analysis (CFA) on six predictors was based, Bollen and Hoyle (1990) suggest that the six indicators assumed have successfully reflected the dimensions. Nevertheless, their framework of perceived cohesion and measurement is still influential and is relevant to current analyses of social cohesion.

*Vertical cohesion and horizontal cohesion.* In addition to outstanding theoretical works, which have been widely referenced, people have also made contributions on measurement. Bernard (1999) considers social cohesion as a quasi-concept and has presented certain characteristics in this regard. According to his summary, there are two analytical perspectives for understanding the meaning of social cohesion. One is expanded to include three elements: equality, liberty and solidarity; and the other is commonly referenced and developed on two levels: the fundamental equality of all members of society with regard to recognition, inclusion and legitimacy, and free engagement in the unified values and social justice of society (Bernard, 1999). Chan et al (2006) applied Bernard's analysis and defined social cohesion as a state of affairs concerning both the vertical and the horizontal interactions among members of society, as characterized by a set of attitudes and norms that includes trust, a sense of belonging and the willingness to participate and help, as well as their behavioural manifestation (Chan et al, 2006). The vertical dimension represents the relationship between the state and citizens, and the horizontal dimension refers to connections within civic society. Chan listed nine indicators: on a horizontal level: 1) general trust; 2) willingness to cooperate and help fellow members; 3) sense of belonging or identity; 4) social participation and passion of civil society; 5) voluntarism and donations; on a vertical level: 6) trust in the public, 7) confidence in political and other major social institutions; 8) presence or absence of major inter-group alliances; 9) political participation (e.g. voting, political parties etc.). In this construct, all possible explicative factors or determinants were eliminated from the concept, thus the final dimensions mostly rely on the political and sociocultural spheres except for the economic one.

*Civic integration and neighbourhood cohesion.* A representative discussion on social cohesion at the macro level is the civic integration of Lockwood. In his framework, the core of social cohesion is assumed to be the institutional unity of citizenship, market and bureaucratic relations (Lockwood, 1996). Therefore, perceived civic integration in his theoretical structure is equal to social cohesion at the institutional level. Social cohesion is an antonym of "social dissolution", and the opposite of "civic integration" is "civic corruption" (Lockwood, 1999). At neighbourhood level, there were several equivalent uses of integration and cohesion. For instance, Robinette et al. (2013) adopted the concept of "perceived neighbourhood cohesion" in exploring its links with daily stress. The concept was interpreted in the form of two issues: calling on neighbours' helps and mutual trust. In an early study about neighbourhood cohesion in Buffalo and Detroit, cohesion was regarded as being indistinguishable from the term integration, which is represented by the number of neighbours known well enough to call on (Fellin and Litwak, 1963).

However, the above studies of cohesion normally simplified the dimensions of neighbourhood integration to obtain a successful transformation and more easily satisfy its use in extended topics. In terms of Lockwood's framework, at the macro-societal level (or institutional level), social cohesion signifies two levels of social integration: orderly or conflictual

links between actors in the society (Lockwood, 1992). Similarly, the definition of integration at the meso level of communities or neighbourhoods is encompassed by the construct of social cohesion.

*Operationalized dimensions in policy discourses.* One reference is the concept proposed by the Organization for Economic Co-operation and Development (OECD), which has applied the concept of “social cohesion” since 1997 (OECD, 1997). Their proposed definition firstly largely adopted the idea of perceived cohesion. One subsector of Canada’s policy research committee on social cohesion understood the term as an ongoing process of developing a community with shared values, shared challenges and equal opportunity, based on a sense of trust, hope and reciprocity among all Canadians. Simultaneously, the other subsector, the French part, explained the issue as a set of social processes that help instil in individuals a sense of belonging to a same community and the feeling that they are recognized as members of that community. This concept corresponds to the two dimensions of perceived social cohesion of Bollen and Hoyle (1990).

Afterwards, studies related to the OECD have refined further structures by absorbing Bernard’s and Chan’s theoretical outcomes. They suggested establishing synthetic index system (including aspects of economic, socio-demographic, health and subjective well-being indicators) enables in-depth measurements. Drawing on these indices, Dicks (2010) published a rank of social cohesion across 33 European countries, and subsequent research expanded this to 39 countries (Acket et al., 2011) in 2011 and to 47 countries in 2013 (Dickes and Valentova, 2013). However, the OECD projects on social cohesion draw more on institutional functions and economic outcomes, which has resulted in the high dependence of tests on indicators related to the market or quality of life.

Maxwell’s definition of social cohesion was developed on the basis of economic growth. As stated in his study, social cohesion may be formed from three ways: in times of hardship; ethnic or religious ties, or a shared ideology; and social institutions attempt to obtain a consensus on values, priorities and the overall goal of a society. In terms of his interpretation, social cohesion involves building shared values and communities of interpretation, reducing disparities in wealth and income, and generally enabling people to have a sense that they are engaged in a common enterprise, facing shared challenges, and that they are members of the same community (Maxwell, 1996).

Jenson had pointed out that the efforts made in political discourses by above organizations primarily aimed to obscure increasing social inequalities. In research by the Canadian Policy Research Network (CPRN), he defined social cohesion in terms of five dimensions: 1) belonging/isolation, citizens feel committed to being the part of the same community with share values and a sense of identity; 2) economic inclusion/exclusion; this refers to equality of opportunity among citizens in a market society; 3) participation/non-involvement in public affairs, which focuses on individuals’ participation in central government and local authorities; 4) recognition/rejection of diversity or pluralism; this dimension looks at difference or tolerance for diversity in a state; 5) legitimacy/illegitimacy, which concerns maintaining those public and private institutions as mediators and connections among individuals (Jenson, 1998).

Although above interpretations of theoretical frameworks in policy discourses were evaluated as ones that do not provide a precise interpretation pertaining to social inequality and institutional mediation, they have still made contributions to measurement, particularly to feasible real-life indicators.

### **Sub-conclusion**

The works probed above have been recently summarized by Schiefer and Noll (2017). They suggest that social cohesion is a characteristic of a social entity, which is supposed to open from a multidimensional perspective and to comprise a profile in terms of three levels: micro (individual), meso (communities and groups) and macro (societal institution). They developed six dimensions: social relations (includes social network, participation, trust and mutual tolerance), attachment/belonging, orientation towards the common good (contains feelings of responsibility for the common good, solidarity and the acceptance of social order and social rules), shared values (includes preference for values that promote cohesion and homogeneity), objective and subjective quality of life (contains psychological well-being, physical health and objective living conditions), and equality–inequality (contains equal distribution of resources, social exclusion and cultural diversity). These six levels elaborate all the points involved in social cohesion, which helps us to have an overview of the structure. However, this construct is too broad and complicated, not only regarding the primary elements (including the economic, political, social and spatial spheres), but also regarding explicative factors

and determinants. Too broad a range may have negative effects on operationalization, leading to confusion in closely related topics (e.g. social equality) and resulting in missing measurements.

As commonly recognized, the principles for judging a valuable concept rely on two points: minimal in scope and close to ordinary usage (Chan et al., 2006). In addition to telling us the essential components, it should also ensure feasible empirical tests to facilitate subsequent work. With reference to certain significant contributions to the dimensions of social cohesion (Chan et al., 2006; Schiefer and Noll, 2017), this study formulated the key criteria for defining the term and the connotations of “neighbourhood integration”.

### **10.1.2.2 Concept: social network**

Social network is recent idea which can be traced back to the late 20th century. Broad exploration of the term in the academic arena started in the 1970s with a growing number of scholars in the sociological, political, physical and even psychological domains. Various interpretations, definitions, meanings and investigation methods have been proposed and tested. Pilisuk (1978) mentions that the rise of the nuclear family following the pre-industrial period led to a transformation in the ancient idea of interdependent links, called a “band” by Linton (1936), among extended family members regarding emotional needs, educational, economic, and security-related functions. Decreased dependence on the extended kinship group and a more isolated way of life in the nuclear family appeared, which have enlightened further understandings on the structure of social networks. In some models, a social network is regarded as a sub-notation of social cohesion. In terms of the interpretation of social cohesion (Schiefer and Noll, 2017), the main concept of dimension “social relations” is the social network. Although more issues are listed in this dimension like “participation”, “trust” and “mutual tolerance”, it is suggested that they be considered in the range of social network.

From theoretical view, a number of British studies applied the term to depict interactions or connections among a group of person (Barnes, 1954; Bott, 1971). However, focused attention on social links among individuals displayed insufficient explanatory power, and more studies on features and definitions have emerged which have contributed greatly to this issue. In terms of the opinion of Wolfe (1970), a social network can be divided into two categories, an unlimited network and a limited network, in terms of examining the means for connections between people. Abundant studies have suggested the dimensions that should be included when examining social networks: 1) source – the social context in which the link is generated; 2) frequency – the number of contacts within a certain time range; 3) duration – the length of the established links; 4) symmetry – the balance of exchange across a link; 5) intensity – the degree of commitment in a link; 6) intimacy – the degree of closeness of a link; and 7) multiplexity – the number of distinct relations or modes of interaction. To examine the function of networks in research, the following classified dimensions allow further feasible studies: 1) reachability, refers to the average volume of a link required between two agencies in the shortest path; 2) density, which means the quotient of the links that occur divided by the total number of possible links, which indicates the closeness and duration of link; 3) range, that is, the number of agencies in the network; 4) homogeneity, which mean the similarity of agencies according to characteristics like age and occupation; 5) clustering, which refers to groups of links and 6) dispersion which refers to the range of social contacts, which may reflect the situation across social classes (Pilisuk and Froland, 1978). According to the above explanations of social network, it would appear that the idea plays a significant role in judging social cohesion. Although both social cohesion and social network are generated from social issues, the latter is more focused on detailed issues which are easier to apply in empirical practices.

## **10.1.3 Quasi-concept of community integration from socio-spatial perspectives**

### **10.1.3.1 Practical differences between integration and segregation**

“Segregation” and “integration” are two opposing terms, but are not direct antonyms in academic studies. Segregation is mainly understood from two perspectives: sociological and geographic. With regard to the first sphere, the concept refers to the absence of interaction among social groups. And regarding the geographic aspect, it refers to an exclusion of places, an uneven distribution of social groups across certain spatial areas (White, 1986; Andersen, 2002b). One application of the socio and spatial dimensions is the four indicator model that was abstracted from Lindenberg’s theory (Lindenberg, 1996): i.e. the social production function. Liu et al. (2014) suggested that residential segregation should be understood in terms of physical and social well-being. The first dimension is described using two indicators: comfort (refers to the accessibility of basic facilities: money, healthcare and food) and stimulation (measured by access to

services such as cultural and education services, entertainment, and non-daily consumption). The second dimension is also evaluated with two sub-indicators: behavioural confirmation (which means the density of the proportion of targeted group) and status (which is reflected by housing price, housing size, housing facilities, and education and occupation status). Studies on segregation address differences that are mainly related to racial and ethnic segmentation regarding socioeconomic, ethnicity and life style dimensions. Many studies commonly associate segregation with issues like immigrants, welfare dependency, economic disadvantage, a high incidence of poverty, unequal access to facilities and education, lack of spatial mobility or social mobility (Western, 1973; Massey, 1990; Bolt et al., 1998). In the literature, many studies have described phenomena by mean of indices and have further explored effects using regression analyses (Wu et al., 2014), however, neither the causes nor the consequences has been adequately described (Ruiz-Tagle, 2013). It is suggested that segregation should be regarded as an intervening factor of poverty, which means that it extends beyond its spatial location, to identity, perceptions such as the social context at individual and group level. Furthermore, in order to address the segregation of neighbourhoods in deprived housing areas, authorities have introduced a series of area-based efforts related to physical renovation, social empowerment, social control and rent reduction (Andersen, 2002a).

With respect to the concept of integration, one of the outstanding proposals for defining “integration” among early discussions is the four-type model of Landecker (1951). Certain efforts based on the composite concept have been formulated to measure integration. The first aspect is cultural integration, which refers to the consistency of standards within the same cultural domain. In Landecker’s study, the proportion of alternatives was used as the reference; the lower the index, the higher the degree of cultural integration will be. With respect to the second aspect, normative integration, the author employed this to describe the integration of cultural standards and the behaviours of members. This dimension adopted the principle of obedience to social standards. Crime rate and welfare efforts (individuals’ contributions) were suggested as a negative index and a positive index respectively to assess the frequency of conformity to social standards. The third dimension, called communicative integration, constitutes ideas of the connections to the group and the relationship to neighbours. The study suggests that two issues should be focused on, spatial barriers and prejudice barriers to communication. In brief, these are physical barriers and psychological barriers. Indices such as the suicide rate and personality disorders, the social visits among the community, frequency of personal contacts within neighbourhoods, and social participation can also be employed in this test. The last dimension, functional integration, refers to mutual interdependence among the units of a system. Landecker (1951) thought the degree of interdependence could be reflected in the division of labour; for instance, the higher the proportion of nonfarm populations, the lower the degree of functional integration will be.

In terms of criteria for investigating the two phrases, integration means much more than the connotation of segregation; notions such as psychological responses and mental expectations are also involved in the concept of “integration”. Therefore, it is inappropriate to regard segregation simply as an opposite term of integration.

#### 10.1.3.2 Definitions of community integration

Questions about integration may inspire a theoretical structure: What is integration? How is integration measured? Under what conditions does integration increase or decrease? And what are the consequences of high or low integration? As to integrationist discussions in relation to urban poverty, both social capital and social exclusion have to be considered (Chaskin, 2013). Compared to concepts such as integration or cohesion, social exclusion shows much stronger links with institutional issues (like poverty, deprivation and marginality), and leads to its high-frequency appearance in the phrasing of policies and institutionally related discourses. In terms of the paradigm shaped by Chaskin (2013), integration issues not only assess material resources and information or opportunities through substantive interactions, but also refer to the broader social consequences of economic-institutional deprivation, engaged actors and the underlying processes. Moreover, the abovementioned four-part structure (cultural integration: the consistency among the standards of a culture; normative integration: the conformity of the conduct of the group to cultural standards; communicative integration: the exchange of meanings through the group; functional integration, or interdependence among group members) of Landecker (1951) also provides a broad view of integration.

In a study by Wong et al. (2006) on the link between community integration and mental health relating to psychiatric disabilities, an integrated community was regarded as an inclusive and accepting place where discrimination in relation

to psychiatric disabilities and against other marginalized populations is absent. Members of an integrated community have equal access to resources, opportunities and engagement in social interactions. Aubry et al. (1996, 2016) have proposed new ideas for defining dimensions of community integration. They emphasize that integration means more than merely accessing community resources and participating in activities. If individuals' perceptions are ill informed, they may fail to understand integration. As a consequence, in addition to absorbing the conceptualized criteria of Segal and Aviram (1978) on physical integration and the works of Unger and Wandersman (1985) on social integration, which were elaborated in their work on social normalization, Aubry et al. (1996) further add the notion of a "sense of community" from McMillan and Chavis (1986) and quality of life (Baker and Intagliata, 1982) as the third dimension. Further, the enhanced construct predicts community integration on three dimensions: physical integration (refers to the factual residence of an individual in the community), social integration (refers to interaction within the community) and psychological integration (means individual perceptions of membership in community, influence, the fulfilling of needs and emotional connection) (Aubry and Myner, 1996: 10; Ecker and Aubry, 2016: 111). In the study by Philliber (1976), neighbourhood integration was divided into two dimensions: contact with neighbours' and subjective integration. The first dimension is more similar to social communication which only targeted times of talking with neighbours. Subjective integration on the other hand covers some perceptions of neighbouring, which included trust, emotional effects, fitting into neighbourhood and support available from neighbours.

### 10.1.3.3 Evaluations of community integration

In line with the structures conceptualized in past studies, community integration has been defined from diverse perspectives. Although a number of ways have been developed to conceptualize dimensions, the main criteria are similar. To summarize the dimensions that have been applied in various studies, neighbourhood integration commonly completely or partly contains connotations of concepts such as access to resources, environmental experience, social cohesion and social integration, social participation, and sense of community (Marcus, et al., 2015).

In this study, the division of community integration adopts three items from Ecker and Aubry (2016) due to their clear and well-understood categories. In this construct, community integration is comprised of physical integration, social integration and psychological integration. While the first two aspects are based on the seeds sown by researchers either in social role valorisation (SRV) (Wolfensberger and Thomas, 1983; Wolfensberger and Thomas, 1994) or in physical accessing community resources and social interactions (Segal and Aviram, 1978; Unger and Wanderman, 1985), the latter was generated from the idea of "sense of community" (McMillan and Chavis, 1986). Physical integration includes issues pertaining to individuals' frequency of involvement in using goods and services within and outside the community, while social integration relates to the frequency and intimacy of individuals in their social contact with neighbours. Psychological integration refers the extent to which an individual perceives membership (sense of belonging), expresses emotional investment and influence in connections with neighbours and feels that help is available from neighbours.

Several studies have defined social integration, such as general social integration, and the social network index with four domains: marriage or partnership, friends and relatives, religious activity, and voluntary association (Berkman and Syme, 1979). The answer "yes" was scored with a value of 1 while "no" was given a value of 0. Furthermore, the frequency of visiting is also used as a criterion for examining social integration. For instance, based questions relating to the social integration measure of Marcus et al. (2015) is "how often do you visit neighbours per year". Three levels of value were created: never, low numbers of visits and high social integration. Visiting numbers over 52 were defined as high social integration among neighbours', which is equal to a frequency of once per week. In a study of the social integration process among migrants in the city of Shanghai, Wang and Ning (2016) proposed four dimensions to map this: social relation integration, economic integration, psychological integration and cultural integration. Furthermore, eleven indicators (i.e. income, job stability, occupational hierarchy, scope of making friends with community members, friendliness, neighbourhood support, habit similarities, identity approval, and willingness to become permanent residents, internet use and legal awareness) were used to correspond to the four dimensions. Some researchers have also pointed out a lack of attention to the contributions of the neighbourhood itself in the social integration issue. One effort was conducted by Marcus et al. (2015) on exploring the role of neighbourhood poverty in social integration. Using logistic regression analyses, the links between neighbourhood poverty and social integration were indicated; namely, that people living in neighbourhoods with concentrative poverty had a lower occurrence of general social integration but

a higher frequency in visiting neighbours, and vice versa (Marcus et al., 2015). In addition, this study shed some light on the differences between general social integration and social integration with neighbours. Similar to the results of Campbell and Lee (1992), due to smaller networks and reduced resources, individuals with low socio-economic status show higher reliance on their neighbours for support. The way in which social integration and the criteria involved are defined may result in different outcomes.

Psychological integration is generated from a sense of community. Based on the meaning of “community”, several researchers had developed their discussions relating to “sense of community”, in which they have included the dimensions of a real community and the characteristics of the residents who belong to it. Sense of community is regarded as a core concept in community psychology to describe the emotions related to belonging (Cicognani et al., 2008). There are several probing works that have contributed to this concept, like the 40 indicator scale developed by Doolittle and MacDonald (1978), social bonding and behavioural rootedness proposed by Riger and Lavrakas (1981), and commitment and satisfaction suggested by Ahlbrant and Cunningham (1979).

In addition, the construct of sense of community has been explored in line with specific issues. For example, in a study conducted from the perspective of psychological association, Glynn (1981) measured 202 behaviours and finally predicted a regression model with the three strongest factors: being expected length of community residency, satisfaction and the number of neighbours one could identify by first name. In addition, Riger, LeBailly and Gordon (1981) examined the relationship between community involvement and residents' fear of crime, the outcome of which identified four important effects: feelings of bonding, extent of residential roots, use of local facilities and interconnection with neighbours. Although various probing angles used in research have brought out different dimensions in conceptualizations, most criteria refer to the same dimensions. Therefore, we have selected the explanation of McMillan and Chavis (1986) to encapsulate the meaning of sense of community. Their definition contains four elements: membership, influence, integration and fulfilment of needs, and shared emotional connection. Membership refers to a feeling of being a part of the community, which possesses boundaries to distinguish the people involved from the people excluded. The boundaries provide emotional safety for the needs and feelings of members, which contributes to forming an intimate group. The second element, influence, can be understood as a matter of or interactions between two actors within the community. Influence is a bidirectional concept; when needs, values or opinions flow along the links between actors, an individual may exert influence on others and may also be influenced by the collective or people. As a result, influence may act as pressure for uniformity, but may also play a role as a positive force for a close community. Integration and fulfilment of needs can be translated into another term, reinforcement, which is an important motivator for a strong community. It has the positive sense of being together, and members are benefited by the association between the individual and the group. Competence (Hester et al., 1976) and shared values positively contribute to emotional and intellectual needs, therefore, joining together is able to satisfy individuals' expectation and needs, and reinforce beliefs. The last component is a shared emotional connection, which includes interactions in shared life events and even a spiritual bond. In conclusion, sense of community is a feeling of belonging, a feeling that members matter to each other within the group, a shared interest or faith, and includes the fact that people's needs can be fulfilled through their commitments. The predictor within the sphere of sense of community is described as neighbourhood attachment in the study of Li and Wu (2013).

Ecker and Aubry (2016) have developed six criteria to predict psychological integration. These assess perceived sense of belonging, neighbourhood safety, available support from neighbours, and emotional investment by attributing scores from 1 (strongly disagree) to 5 (strongly agree) to describe psychological integration within neighbourhoods. The measurement sheds some light on using dimensions and predictors in empirical research. Nevertheless, a contribution devoted by their research stresses the significance of comparative analysis, which may serve as a reference for understanding the truth and degree of integration (Aubry and Myner, 1996). Furthermore, several researchers are committed to either conceptual community integration over the groundwork of preceding outcomes or to articulate criteria for the construct (Wong and Solomon, 2002).

## 10.1.4 Measurements of neighbourhood integration

### 10.1.4.1 Predictive indices based on multi-group information

While numerous academic efforts have emphasized the absence of a standardized definition of integration and insufficient desegregationist policies (Modarres, 2004), several researchers have focused on articulating integration in empirical studies through methodological exploration. The concept of neighbourhood integration has also been broadly adopted in academic discussions on racial segregation issues in the United States. In these research studies, neighbourhood integration has been examined according to population diversity. Researchers assumed greater racial heterogeneity within neighbourhoods equals integration, while less mixed residential units equals segregation. This application is represented by studies on the racial succession model and ethnic diversity at neighbourhood level (Lee and Wood, 1991; Wood and Lee, 1991).

One approach used is qualitative analysis, such as discussions about the residential mobility of the black middle-class (Pattillo, 2005). Few studies in this field have used qualitative methods, with the majority of the related literature concentrating on quantitative methods to test racial integration. This measurement focuses on portraying the degree of integration using mathematical indices like the proportion of black people (Ellen, 2000), the entropy index (Theil, 1972; Theil and Finizza, 1971), the neighbourhood diversity index (Carlson, 1992) and the exposure (isolation) index (James, 1986; Lieberman, 1981). In Ellen's discourse, integrated neighbourhoods are assumed by a proportion of 10–50% black population in relation to the total population (Ellen, 2000). This index had been widely questioned for fixing and difficulties in dividing "isolated" and "integrated". In recognizing its disadvantages, further research has proposed a dynamic concept, "stable", to reflect racial integration at neighbourhood level. The "stable" refers to less than a 5% change in the black population (Lee and Wood, 1990), with this changing rate referring to a stable neighbourhood, which speculated to be racial integration.

Based on the outcomes of researchers using these two calculations (Massey and Denton, 1988; White, 1986; Maly, 2000), Modarres (2004) made notable efforts in the use of indices of entropy and dissimilarity. He compared their advantages and disadvantages by using census tract data of Los Angeles from 1940–1990 and offered suggestions that need to be considered in empirical operations. In the research, populations across census tracts were divided into 14 demographic units which were placed in 14 categories to compute the degree of diversity of each geographical pattern. According to the mean of entropy values, the author regrouped tracts on four levels: integrated, moderately integrated, moderately segregated and segregated. By comparing the numbers and percentages of tracts within four integration levels decade by decade, the shifting social integration of Los Angeles resulting from an increase in moderately integrated tracts and a decrease in moderately separated tracts was indicated (Modarres, 2004).

The dissimilarity index has also been employed to reveal the effects of mixed-race households on neighbourhood segregation (Ellis, et al., 2012). By comparing dissimilarities among targeted groups (i.e. white-black, white-Asian, and white-Latino) to the total population and to single-race households, the research tried to reveal how much those who live in mixed-race families affect neighbourhood segregation through the gaps between the two values (i.e. dissimilarity value to total population and dissimilarity to single-race households). Finally, for any mixed-race household, their segregation from the single-race household population was always higher than that to the total population. This indicates that mixed-race families have positive effects on neighbourhood racial integration, and white-Latino and white-Asian households may exert higher effects on racial integration than the positive effects of the white-black group (Ellis, et al., 2012). Furthermore, the dissimilarity index was applied to demonstrate relationships between each of the two demographic groups. Owing to the successful measurement of the principle of transfer among multi groups, either from a sense of conceptualization or mathematics, the entropy index conveys reliable information about segregation in multi groups (Reardon and Firebaugh, 2002; Mora and Ruiz-Castillo, 2008). The above tests have proven the reliability of the entropy index in depicting social diversity among demographic categories in metropolises.

### 10.1.4.2 The spatial turn in the predictive indices

Because of the attractive features of the index of dissimilarity, easily accessible data and a simple computation process, it was widely used for a while. However, the results largely depend on the size of basic geographic unit; this is referred to as the "grid problem" (Winship, 1977; Taeuber and Taeuber, 1965) or modifiable areal unit problem (MAUP) (Hong and Sadahiro, 2014). Similarly, the speculated greater segregation in metropolises than in smaller cities was manifested



as a spurious result caused by the different scales of the census tracts (Krupka, 2007). Smaller sizes and smaller percentages of minorities then result in a larger value for dissimilarity. A few scholars are in favour of micro geographies like block groups (residents within a block) as the measurement scale, which reveal greater racial segregation (Frey and Farley, 1996). However, neither accounts for the relationship between statistical groups or the organic relationship within groups, which limits the explanatory range of the index.

Regarding the lack of spatial structure, several people have improved original index by adding distance to it (Morrill, 1991). Furthermore, White (1983) proposed the use of spatial proximity to predict segregation. The principle of the index is defined in terms of spatial distance between statistical groups, in which far distance is postulated as “being segregated” and the proximate area was “unsegregated”. Highlighting spatial connections when examining proximity rather than the dissimilarity index may imply more meaning. However, issues within statistical units inevitably occur, because of each unit assumes the distribution of people and functions is average and consistent, in other words, the inherent features are totally removed from a calculation, segregation outcomes in line with spatial proximity are still unable to distinguish various uneven settings and fail in regard to effects of unit size, which is the same as the dissimilarity index (Hong and Sadahiro, 2014).

Another noteworthy effort successfully developed a graph-based measurement to explain physical relationships within and between units (Hong and Sadahiro, 2014). By means of a concentration profile (density) and spatial proximity profile, the evenness of the targeted population type across the whole area (which is the proportion of the targeted group to the total number of a qualified unit which is determined by a logical function) and the clustering of all the defined units (which were named according to the degree of concentration of the targeted population in a certain area: not segregated, randomly segregated or completely segregated) depict the degree of segregation or integration of the group. Using concentration and proximity appears to be superior in portraying the physical distribution of units and interconnections among them. Nevertheless, Deurloo and Vos (2008) also draw on measuring the spatial features of segregation. They have applied the measure stemming from the idea of Marcon and Puech (2010): a distance-based approach to evaluate the directional attraction or rejection from one ethnic group to another in Amsterdam.

To obtain an overview of index-based approaches, five dimensions have been addressed in assessing race/ethnic integration/segregation: evenness, exposure/isolation, concentration, centralization and clustering. While first two dimensions focus on social characteristics, the last three relating to geographic features. Owing to similar meanings among several of them (like evenness and concentration, exposure and clustering), Wong (2008) suggest compressing them into the two most effective indexes: clustering and exposure, with both relevant evaluations corresponding to socio and spatial integration. The technicalities of the above indices make it easy to measure the segregation of groups on multiple scales (from smaller block groups, neighbourhoods, to census tracts). Although these improved studies from a geographic viewpoint, Friedman (2008) questioned the mismatching results conveyed by the index of dissimilarity to integration. As mentioned, the decline of index values were due to increases in the number and degree of mix of multi-ethnic neighbourhoods, rather than in mixed white and black neighbourhoods. Therefore, translating the declining value of the dissimilarity index into racial integration appears to be doubted. In addition, the precise topic in these research studies should be understood more as racial or ethnic integration, which refers to the degree of physical integration (residential mixture) within neighbourhoods, rather than as neighbourhood integration (Quinn and Pawasarat, 2003). Neighbourhood integration has been treated merely as a mixture roughly corresponding to a larger spatial area like a city or a metropolis (Galster, 1998). It is notable that Galster (1998) improved the scheme by defining stable and dynamic dimensions, and Friedman (2008) redefined integrated neighbourhood according to the proportion of non-Hispanic, black and others within the area.

In addition, rather than showing clear statistics of race and ethnicity, the segregation of geographic units, such as social housing community, tends to be indicated by empirical surveys at the individual level. However, these models in essence still target a racial mix in the neighbourhood area and seldom employ indices to totally define real neighbourhood integration. Due to the absence of testing on dimensions of meaningful social interaction among individuals or groups and a lack of psychological integration (e.g. belongings), indices oversimplify connotations (which only draw on physical integration) and are inadequate for describing micro-integration at neighbourhood level (Pettigrew, 1998; Ecker and Aubry, 2016, Hong and Sadahiro, 2014).

### 10.1.4.3 Exploring internal the factors of neighbourhood integration

While a number of studies emphasize two aspects – evaluating the degree of neighbourhood integration, and testing relationships between neighbourhood integration and social performance or health – several people have addressed the role the neighbourhood itself plays in the integration progress within the geographical units. Several studies have attempted to identify the roles played by internal factors like age, gender and education, using regression analysis and correlation analysis (Marcus et al., 2015).

Using the mean of path analysis, Philliber (1976) tested the way in which the factors prior training (education, occupation), vested interest (family structure, home ownership) and opportunity (length of residence) impact on neighbourhood integration. The integration may be understood from two dimensions: contact with neighbours and subjective integration. Frequency of conversations was used to reflect neighbourliness, and seven sub-questions were selected to portray subjective integration. The model indicated that all listed factors make a contribution to integration, particularly the subjective factor (Philliber, 1976).

### 10.1.4.4 Qualitative analyses

When integration has been widely examined in many studies using quantitative approaches, seldom investigations have focused on qualitative methods. However, the neighbourhood is an inherently social process, which is far more than merely a physical unit. Therefore the accurate using of qualitative methods may provide larger amounts and more reliable information. Hand et al. (2017) have summarized several efficient qualitative methods for coping with issues related to person–place transactions from 1,965 articles published within the past two decades, and indicated approaches such as Photovoice, GIS tracking and interviews, go-along interviews. The Photovoice method refers to the synchronous recording of photos and notes, resulting in thematic discussions or analysis of all photographs, and finally complete write-ups. GIS tracking and interviews means displaying diaries or any relative data based on GIS data which is also used during fieldwork. Go-along interviews are fulfilled by taking pictures, participating in all activities that occur during the interviews, and writing notes afterwards.

As Rich (2009) has stated, the definition of integrated in a neighbourhood should take individuals' perceptions into account rather than being an exclusive view on statistical integration. By collecting data and qualitatively analysing homeowners' perceptions of racial integration in their neighbourhoods, the existence of great differences has been verified between realized integration and statistical integration regarding racial relationships. Semi-structured interviews and deep fieldwork offered a great deal of information about the perceptions of local long-time residents, newcomers and exiters. The narration involved shows us that racial integration appeared to be more serious than officially reported. Moreover, race and class often decide the mental social boundaries within neighbourhoods instead of the physical ones, meanwhile, segregation was also clearly demonstrated in shopping-area separation by race (Rich, 2009).

In addition to these efforts, Farley et al. (1979) employed an image survey to identify the residential preferences of whites and blacks with regard to neighbourhoods where racial groups mixed in different proportions. This method demonstrates the advantages of directly seeking mental senses through visual judgement. The different ranking results from blacks and white not only provided direct and correct information about the extent of integration but also provided great benefits in identifying acceptable levels on both sides and balancing them for a real functioning neighbourhood with better integration (Farley, Bianchi and Colasanto, 1979).

Our qualitative analysis was limited to in depth interviews, face-to-face questionnaires and tracking photos. Though neither direct responses to GIS-based photos nor involvement happened in all observations, the method of face-to-face communication between interviewer and interviewee served to provide reliable and precise data.

### 10.1.4.5 Combined application of quantitative and qualitative methods

Because seldom notice is paid to the functions of several objective factors of living conditions, Yanos et al. (2007) attempted to identify in what way the unaddressed factors like neighbourhood characteristics (e.g. socioeconomic disadvantages, immigrant concentration and residential stability), housing type (independent apartments and congregational settings) and lifestyle (locus of meaningful activities) contribute to neighbourhood integration. Their analysis was based on the three-dimensional conceptual structure of Wong and Solomon (2002), which forms a comprehensive investigative plan. Physical integration is interpreted as external community integration (ECI) which

refers to the use of services and social activities (Segal and Aviram, 1978); social integration is explained by the social functioning scale (Birchwood, et al., 1990), and the psychological facet uses the scale of theoretical sense of community and another two questions (fitting to neighbourhood and to building). Following the quantitative analysis of indicators on the three dimensions and on living conditions by means of chi-square tests and correlation analysis, further qualitative analyses were used to explain the part of perceived response. Findings confirm that meaningful activities in the spatial scale, neighbourhood or buildings have significant positive effects on perceived community integration. In addition, housing types may limit opportunities for meaningful activities, and further lead to integration barriers. Socioeconomic indicators were proved to have no associations with perceived integration, while the group of newcomers and immigrants were negatively linked (Yanos, et al., 2007). While a numbers of research studies seek to identify the determinants that produce or underpin social exclusion, attention is also paid to factors that may relieve this.

### 10.1.5 Extended studies on the effects of neighbourhood integration

In addition to commonly recognized demographic factors (i.e. age, gender, education, homeownership, occupation, income), many studies also illustrate the role of neighbourhood effects. A study by Fellin and Litwak (1963) has provided evidence that primary group factors were affecting integration outcomes. In terms of results, positive neighbourhood norms towards newcomer, the increased presence of voluntary associations, a less competitive group and fewer relatives may accelerate the integrative progress. The majority of the literature tends to emphasize the negative effects of neighbourhood segregation. Low-income neighbourhoods and single ethnic neighbourhoods in particular present disadvantages for social contact; and an absence of economic activities and isolation from potential work opportunities mean that there is less chance of receiving a good education and preventing decline of living conditions.

**Effects of neighbourhood imprisonment.** Using hierarchical linear model, Burch (2014) explored the relationship between dissimilarity index-based segregation at neighbourhood level and the imprisonment rate. A positive correlation demonstrated that higher segregation levels would increase the possibility of imprisonment in the neighbourhood. Through multiple-level discussions on relationships between neighbourhoods and engagement in economic activities and the labour market, Urban (2009) illustrated that the segregation of ethnic groups at neighbourhood level shows a parallel relationship with their segregation in the labour market. Similarly, Cheng and Wang (2013) have indicated negative neighbourhood effects on migrant workers' wages in urban China.

Using linear regression analyses, Danzer and Yaman (2013) provide evidence of a negative relationship between co-ethnics/migrant concentration and integration. At the same time, the spatial formation of minority-domain neighbourhoods (e.g. ethnic concentrations, immigrant enclaves, high poverty neighbourhoods) should not be attributed as the only cause that reduce the progress of their integration into the host society. However, isolation and/or unpleasant integration is also linked to personal characteristics like age and education (Danzer and Yaman, 2013).

Moreover, Keels (2008) demonstrated the effects that the Gautreaux programme has on the lives of the children involved. This programme aimed to give low-income black families and families in public housing a chance to be incorporated by the host society by way of moving these families to white communities. The study mentioned that a consideration of ethnic composition plays a significant role in children's future economic participations and may provide real benefits to their integration. With respect to how the effects of concentration of economically or institutionally disadvantaged groups develop through the generations, Sharkey (2012) focused on Chicago neighbourhoods to reveal this dynamic progress among youth.

The above studies have examined the negative effects of neighbourhood segregation on economic ability, participation in the labour market and mental health (Lewin-Epstein, 1986; Luttmer, 2005; Urban, 2009; Pastor and Morello-Frosch, 2014; Cheng and Wang, 2013). However, segregation may also bring several benefits. Some researchers have tried to portray the positive effects of segregation, such as avoidance of conflict, decrease in anonymity (Suttles, 1972), enforcement of local cultural and social networks, and a basis for political effects at local level (Bolt et al.; 1998). Residents in similar living situations appear to easily form common cultural attitudes and behaviours. Meanwhile, the concentration of an ethnic group makes it simple to shape a local network along which both economic activities and social contacts. Consequently, people within the group may possibly be satisfied in terms of psychological perceptions

and physical needs. Furthermore, strengths may also be demonstrated in the political area; the stronger the group, the more powerful the voice in for fighting rights (Bolt, et al., 1998).

**Application of neighbourhood integration in inclusionary zoning (IZ).** Inclusionary zoning refers to a mixed-income housing policy that fulfils income integration through the inclusion of low-income residential housing within a market-oriented housing neighbourhood. The most commonly recognized form of IZ is a residential area where market housing and public housing are mixed. As stated, the outcomes of most studies on neighbourhood shift in IZ indicate a negative relationship between stable racial integration and the presence of subsidized housing programmes (Kontokosta, 2013). In empirical research about neighbourhood integration in IZ in Montgomery county and Suffolk county in New York, Kontokosta (2013) measured and articulated the changes from 1980 to 2000 in line with three components: race, income and stability. The entropy index was utilized to account for racial and income integration, and the change quotient of blacks accounted for stability. As a result, racial integration in the IZ programme was confirmed while income diversity remained constant.

**Testing of interactions between household-scale racial integration and neighbourhood-scale racial integration.**

Since the doubts about generally equating neighbourhood racial diversity to higher levels of neighbourhood integration, some researchers have suggested concentrating on smaller units, racial mixing within a household, to explain further effects and neighbourhood integration. Ellis et al. (2007) assessed the question by calculating the dissimilarity index and the exposure (isolation) index of 12 metropolitan areas in the US. The first calculation targeted a population of two racial groups in a tract while the second step only targeted people of the above two racial groups who were not in racially mixed households. By comparing score differences between the two steps, a larger gap may reveal greater effects of household racial mixing on neighbourhood racial integration and vice versa. White-Asian, white-Latino and white-black households may produce greater effects on racial diversity in neighbourhoods than black-Latino and Asian-Latino households. Moreover, without the effects of racially mixed households, the exposure of minorities to white would decline greatly than the reduced exposure of whites to minorities (Ellis et al, 2007).

**Community integration in the mental health area and neighbourhood effects on public health.** Recently, there have been calls to connect public health issues to community development. Community integration is assumed to be a potential means that reduces health problems (Pastor and Morello-Frosch, 2014; Gustafsson et al., 2014). The huge developing in residential programmes for address community integration in the United States has been criticized for its biased interpretation. In response to the lack of regards for social interaction, recent studies have focused on probing social relations and the communications of mental disabilities (Wong et al., 2006). Their analyses have stressed the importance of building normalized and safe social relationships by discussing some effects such as mutual accommodation and institutional or homeless mind-sets.

## 10.2 Data and methodology

Based on the above descriptions, tests of community/neighbourhood integration contain a number of indices along several dimensions. Drawing on residents of social housing communities means that this study extends beyond the concept of the residential unit to a spatial cluster of highly homogeneous neighbours. Therefore, this analysis of neighbourhood integration not only includes the connotations of “social communication” and “social participation”, but also dimensions relating to “sense of community” “social cohesion” “residential satisfaction” which address psychological perceptions. The investigation mainly makes reference to the three-dimensional theoretical construct of Aubry et al. (1996, 2016): physical integration, social integration and psychological integration. External community integration (ECI) defines physical integration as the use of services and social activities within one’s neighbourhood. In other words, it refers to the access to resources. In addition, Perkins et al. (1990) put forward the concept “transient physical environment” in their framework of social participation. This concept stresses the association between physical symbols produced and participation behaviours. Both boundaries like visible signs of disordered places, and defensive objects such as privatized environment against pressures of crime-related problems, are recognized as phenomena that respond to community negative problems. These objects may produce opportunities for community improvement and in turn may boost social participation and level of integration, or the reverse (Perkins et al., 1990). However, because the first dimension of their paradigm refers to access to public services and job opportunities, which have been

tested in detail in chapters 6 to 9, this analysis on neighbourhood integration removes the overlapping dimension of “physical integration” and only abstracts the other two concepts as references. With respect to how the concept translates into feasible survey questions and what indices are considered in order to respond to connotations of the concept, this study has listed concepts, dimensions, indices and survey questions correspondingly in Tab.10.1 and provides detailed explanations relating to the research structure. .

**Tab. 10.1 Study structure for neighbourhood integration in social housing communities**

	Dimensions	Referential indices and questions	Corresponding empirical questions in survey <sup>a</sup>
Social integration	<ul style="list-style-type: none"> <li>- Social participation/ social functioning</li> <li>- Social communication</li> </ul>	<p><b>Questions to social participation:</b></p> <ul style="list-style-type: none"> <li>- Participation in public activities: vote, election of community committee</li> <li>- Participation in institutional activities</li> <li>- Participation in occupational activities: involvement in work, education and work training activities</li> <li>- Participation in religious activity</li> <li>- Participation in prosocial activities: community activities such as going to public places, movies, sports etc.</li> <li>- Participation in voluntary association</li> <li>- Participation in other leisure activities: entertainment (recreation) activities: outdoor leisure activities, sports, hobbies, arts, cultural, caring work, online activities</li> </ul> <p><b>Questions to social communication:</b></p> <ul style="list-style-type: none"> <li>- Social ties: the number of relatives and friends in current neighbourhood</li> <li>- Social contacts: contact with people within homogeneous group, contact with local citizens, the mixed circle of friend and acquaintance</li> <li>- Community interaction: contact with people of surrounding housing districts, intimacy or difficulties between the contacts?</li> </ul>	<p><b>Questions to social participation:</b></p> <p><b>E1-E9 (in survey):</b> How often do you contact the following organizations (i.e. Social housing office of Guangzhou, Guangzhou municipal civil affairs bureau, district street office, district neighbourhood committee, property company, local police station, district volunteers’ organization, and district owner (Eigentümer) committee, media)?</p> <p><b>E10-E17(in survey):</b> Do you participate in the following community activities (i.e. election of the community neighbourhood committee, election of the community owner committee, cultural activities of the community centre, recreational activities of the community centre, community volunteering activities, spontaneous community donation activities, outdoor leisure activities, and discussions on community building issues online or in meetings)?</p> <p><b>Questions to social communication:</b></p> <p><b>D11 (in survey):</b> How many friends do you have in your new community?</p> <p><b>D12 (in survey):</b> How many new friend have you made?</p> <p><b>G2 (in survey):</b> After moving in, how many surrounding commercial housing residents did you get acquainted with?</p> <p><b>D1-D10 (in survey):</b> How often do you contact with following groups (i.e. people in the same building, people in the same community, people in the neighbourhood communities, people of my former old community, old Guangzhou residents, new Guangzhou residents, low-rent community housing residents, community economic housing residents, people who love community cultural activities, and volunteers of social welfare activities)?</p> <p><b>F1-F6 (in survey):</b> Frequency of visit and contact between communities</p> <p><b>F7-F13 (in survey):</b> Activeness and reciprocal exchange when individual contacts with surrounding residents</p> <p><b>F14-F19 (in survey):</b> Do you ask helps from any relatives or friends in surrounding communities, and how does the interaction change after moving into current housing?</p>

<b>Psychological integration</b>	<ul style="list-style-type: none"> <li>- Sense of community</li> <li>- Social cohesion and trust</li> <li>- Social climate</li> <li>- Residential satisfaction</li> </ul>	<p><b>Questions to sense of community:</b></p> <p><b>a) Reciprocal exchange within community</b></p> <ul style="list-style-type: none"> <li>- Neighboring behaviour: Neighbourhood residents may sort out problems together</li> <li>- Emotional contribution/mutual helps: Neighbourhood residents concern about each other. I can get help from neighbors; I serve helps to my neighbors</li> </ul> <p><b>b) Individual recognition to the community</b></p> <ul style="list-style-type: none"> <li>- Belongings: I belong to this neighbourhood</li> <li>- Shared value: Neighbourhood residents have the same value, perspectives and habits</li> <li>- Acceptance: I prefer to stay a long-term in this neighbourhood</li> </ul> <p><b>Questions to social cohesion and social trust:</b></p> <ul style="list-style-type: none"> <li>- Being trusted</li> <li>- Acting with courtesy</li> <li>- Being proud of their environment</li> </ul> <p><b>Questions to social climate:</b></p> <ul style="list-style-type: none"> <li>- Fear of crime</li> <li>- Community problems</li> <li>- Informal social control</li> </ul> <p><b>Questions to social satisfaction:</b></p> <ul style="list-style-type: none"> <li>- Residential satisfaction to respondent's socio-demographic characteristics (e.g. age, marital status, education, gender, income, presence of children)</li> <li>- Residential satisfaction to housing characteristics</li> <li>- Residential satisfaction to socio-spatial features of neighbourhood (e.g. physical environment, access to services, facilities and socioeconomic settings)</li> </ul>	<p><b>Questions to sense of community:</b></p> <p><b>a) Reciprocal exchange within community</b></p> <p><b>D17 (in survey):</b> What do you think of the mutual care?  <b>D18-D20 (in survey):</b> what do you think are the main conflicts?  <b>D21-D23 (in survey):</b> Which solution do you often use when you encountering conflicts?</p> <p><b>b) Individual recognition to the community</b></p> <p><b>D13 (in survey):</b> how often do you contact your new friends?  <b>D14-D16 (in survey):</b> How did you get to know these new neighbors?  <b>H49 (in survey):</b> Would you like to live here long-term?</p> <p><b>Questions to social cohesion and social trust:</b></p> <p><b>G3-G8 (in survey):</b> To which degree are you willing to communicate with following residents (close friends, friends, neighbors, colleagues, keep distance, no contact)?</p> <p><b>Questions to social climate:</b></p> <p><b>E18-E22 (in survey):</b> Have you made following experiences during the past year (i.e. been beaten, been cheated, been stolen, been threatened, and been robbed)?</p> <p><b>Questions to social satisfaction:</b></p> <p><b>H1-H19 (in survey):</b> Are you satisfied with the following community aspects (e.g. indoor ventilation, indoor lighting, corridor space, security etc.)?  <b>H44-H48 (in survey):</b> prioritized factors in choosing an ideal district  <b>H41-H43 (in survey):</b> The three most ideal social housing community  <b>H50-H52 (in survey):</b> If you intend to move, what is the reason?</p>
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Note: <sup>a</sup> To find survey questions and corresponding code in Appendices A.2. Source: own draft, Oct. 2018.

### 10.2.1 Social integration

Studies of social integration have identified their own ways of responding to the concept. For example, in an examination of the social integration processes of migrants in the metropolis in Shanghai, the author proposed four dimensions for mapping this: social relation integration, economic integration, psychological integration and cultural integration (Wang and Ning, 2016). Furthermore, 11 indicators (i.e. income, job stability, occupational hierarchy, scope of making friends with community members, friendliness, neighbourhood support, habit similarities, identity approval, willingness to become permanent residents, internet use and legal awareness) were identified to correspond with the four dimensions. According to the model of Keene et al. (2013), the subordinate notions of social integration consist of four dimensions: social support, social ties (the number of relatives and friends in current neighbourhood), social contacts - which is examined in terms of three dimensions: contact with people within homogeneous group, contact with local citizens, the mixed circle of friend and acquaintance (Gijsberts and Dagevos, 2007), and reciprocal exchange (do you do favours for each other? Take care of their properties while they are away? Provide advice about personal issues? Visit in each other's homes?) (Keene, et al., 2013). Although the dimensions have been named differently in studies, the connotations and testing indices are similar. To conclude on the outcomes and existing constructs of the social integration scheme, this study takes two abstract concepts (i.e. social participation and social communication) and embodies them by means of the empirical questions in the survey (see Tab.10.1).

**Social participation/social functioning.** A social functioning scale was suggested to assess the interpersonal relationships of psychological patients (Birchwood et al, 1990s). The functioning structure shows the advantages and reliability of assessing patients' situation more fundamentally. The examination applied seven criteria to explain social functioning; these are 1) social engagement/withdrawal (length of stay, social avoidance, initiation of conversations); 2) interpersonal behaviours, which includes number of friends, quality of communication etc.; 3) prosocial activities, which includes involvement in common social activities like going to public places, doing sports; 4) leisure activities, which

comprises engagement in common hobbies, interests or pastimes etc.; 5) independence competence, which refers to ability to perform essential skills to live an independent life; 6) independence performance, which means the degree to which indispensable abilities are displayed; 7) occupation, which refers involvement in employment activities. With reference to these criteria, our study has adopted four key and valid aspects to identify social participation/social functioning: independence, social engagement, interpersonal connections and daily activities. In our study, we conceptualized social participation using the responder's presence on seven aspects (see Tab.10.1): 1) public activities (vote, election of community committee); 2) institutional activities; 3) occupational activities (involvement in work, education and training activities); 4) religious activities; 5) prosocial activities (community activities such as going to public places, movies, sports etc.); 6) voluntary associations; 7) other leisure activities (entertainment/recreational activities, outdoor leisure activities, sports, hobbies, arts, culture, caring work, online activities).

Our survey listed nine institutional organizations and eight neighbourhood activities to examine personal initiatives in community-related social activities. With respect to the facet of social participation, most research has made use of dichotomous questions with either "yes" or "no" answers. When comparing binary variables to count presence as "yes" or absence as "no", a continuous and multidimensional scale may offer more valid and reliable information (Perkins et al, 1990). In additional, because of the differences among the 13 communities, which may highly depend on the management of local organizations, as well as the irregular frequency of local activities, it is better to use standardized scales for psychological assessment than numbers of presence. As seen from Tab.10.1, questions include frequencies of contacting organizations (survey questions E1-E9) and times of joining community activities (survey questions E10-E17). The designed five-item scale ("very often", "often", "normal", "rarely" and "never"; or "every time", "often", "sometimes", "rarely" and "never") enabled respondents to be cognitively involved when answering, which provided us more trustworthy data. All the multidimensional indicators were dealt with by the normalization process and the weighted values make it possible to conduct standard calculations of integrations which were determined by the number of predictors.

**Social communication.** In addition to participation, some researchers have examined integration mostly by addressing social communication and perceptions. These structures mainly contain ideas like social support, social ties, social cohesion and reciprocal exchange (Keene et al., 2013). Generally, social communication is assessed by the following questions: the number of relatives and friends in the current neighbourhood, contact with people of different identities or in different physical distances (Gijssberts and Dagevos, 2007). The concept of reciprocal exchange draws on individual evaluations and mental perceptions (e.g. Do you do favours for each other? Do you take care of their property when they are away? Do you provide advice to personal issues? Do you visit in each other's homes?), this study reclassified this idea into the psychological dimension.

Bradburn et al.'s (1970) opinion relating to the way of recognizing integration informs the research questions in this section. As mentioned, integration also covers residential proximity and quality of life. To obtain good answers, our survey considered factors like identity, physical distance, housing type, household type. Firstly, living next door to each other or living in same quality of housing should be considered in the investigation. In terms of suggestions of Bradburn et al. (1970), this study surveyed intimacy between people who are in the same building, in the same spatial section, in the same neighbourhood and those in the same kind of housing. Survey questions D1–D10 investigated contact between the interviewee and the mentioned groups (see Tab.10.1). Additionally, because social housing is a subsidized project and the majority of residents have weak economic or subsistence abilities, these features may cause heterogeneous situations in terms of the surrounding environment. We thus added the investigation of community interaction, through contact between the target people and people in the proximate commercial residential neighbourhoods to reflect social integration. Survey questions in Part F (from F1–F19) are about communication between people in different neighbourhoods. Both the responses from 660 residents of social housing and the answers from 60 interviewees in three neighbourhoods respectively next to Jude, Jinshazhou and Fanghe, may provide information on community interaction.

### 10.2.2 Psychological integration

With respect to psychological integration, Aubry et al. (1996, 2016) propose the following connotations: identity recognition, perception of sense of belonging, feeling about living conditions, sense of fitting in with their surroundings,



neighbourhood safety, contribution, and emotional connections/attachments (investment and influence, available support from neighbours, feelings about the availability of help from neighbours). Simultaneously, several conceptualized theories, like sense of community, social cohesion and trust, residential satisfaction and social climate, reflect psychological perceptions of integration from various aspects. However, these theoretical structures were applied in independent research studies, which may cause sub concepts to overlap. In order to have concise and complete indices, this study took the most valuable concepts from those theoretical systems and used them to design the survey questions (see Tab.10.1).

**Sense of community.** As discussed above, psychological integration is mainly generated from the idea of the sense of community (McMillan and Chavis, 1986). It refers to individual perceptions about membership (sense of belonging), expresses emotional investment and influence in connection with neighbours and feelings about the availability of help from neighbours. The study designed by Perkins et al. (1990) encompassed sharing values, feelings of belonging, mutual recognition among neighbours, expecting a longer term of residence, and ability to solve conflicts. However, the questions were overlapped somewhat with the range of community satisfaction, which may result in confusion in an investigation. This problem may be attributed to an unclear definition of sub-indicators. Lack of accurate standards when formulating integration frameworks may bring about the misuse or overuse of a question, and further leads to residual investigations. Predictors of sense of community in this research use the four-element conceptual structure of McMillan and Chavis (1986) for reference. Other items like satisfaction are reclassified into social satisfaction. The empirical investigation makes reference to the following aspects: 1) I belong to this neighbourhood; 2) I know a number of neighbours; 3) Most neighbours know me; 4) I prefer to stay long term in this neighbourhood; 5) Neighbourhood residents have the same values, perceptions and habits; 6) Neighbourhood residents may sort out problems together; 7) Neighbourhood residents are concerned about each other; 8) I can get help from neighbours; and 9) I provide help to my neighbours. In our survey, those predictors were transferred to detailed questions in Part D (see questionnaire in Appendices A.2) about numbers of friends and mutual care for or conflict among neighbours.

**Social cohesion and trust.** Social cohesion is also a complicated theoretical scheme. According to the research questions, many detailed notions were structured into schemes in different ways. However, ranges of social cohesion are both broad and narrow, and Schiefer and Noll (2017) have contributed a great deal in their review work concerning the all the core components ever used in published studies. Drawing on the concluded dimensions, past definitions span six dimensions: social relations, identification/belonging, orientation towards the common good, shared values, objectives and subjective quality of life, and (in)equality. Most studies concentrate on the first four dimensions. In applications by Sampson et al. (1997), willingness to help neighbours, close-knit neighbourhood, neighbours can be trusted, comfortable connections with neighbours and neighbours sharing the same values were used. In a study about the impacts of ethnic diversity on social cohesion in London, Sturgis et al. (2014) regarded meaningful social contacts as the dimension to evaluate. They assumed that more meaningful contact consist of greater intimacy and greater mutual trust will be. Three questions were selected to measure what social cohesion is: being trusted, acting with courtesy and being proud of their environment. To refer to the core elements of social cohesion and trust, this study takes three elements: being trusted, acting with courtesy and being proud of their environment, as the indicators. At the same time, survey questions addressed willingness and anticipation of interviewees regarding relationships with neighbours (see questionnaire G3-G8 in Appendices A.2).

**Residential satisfaction.** Generally, residential satisfaction refers to satisfaction with the community or neighbourhood. Residential satisfaction has received increasing attention and has been regarded as one of the main indicators (Li and Wu, 2013). In an overview of past studies, the factors involved focused mainly on three aspects: respondents' socio-demographic characteristics (e.g. age, marital status, education, gender, income, presence of children), housing characteristics (includes factors about the physical condition of houses, location, housing tenure and so on) and socio-spatial features of the neighbourhood (e.g. physical environment, access to services, facilities and socioeconomic settings). Our questionnaire investigated satisfaction with eighteen aspects which cover the physical environment and human management (see Tab.10.1). Additionally, we also queried the expectation of long-term residence in the current community and the reasons for this.

**Social climate.** This term normally includes the following interpretations: fear of crime, community problems, sense of community, communitarianism (which is equal to sense of belonging, emotional involvement, emotional contribution, influence, and acceptance, mutual help), community satisfaction, organizational efficacy, neighbours' behaviour (include both giving and receiving all kinds of assistance from neighbours) and informal social control (Perkins et al., 1990). Among them, communitarianism may be regarded as the response of individuals to the concept of "sense of community". For example, from a personal perspective, how important it is for you that you are liked, are actively involved in any community efforts. Organizational efficacy refers to perceptions of the efficacy of local collectives or similar functional organizations. In social housing communities, there are several kinds of organizations functioning effectively. Some of them were built by the institutional system (e.g. neighbourhood committees, social housing offices or work stations, local police stations and the property companies). Others were formed spontaneously with aim of maintaining rights for members, such as the owner committee and voluntary organizations. These grassroots bodies are equivalent to informal control forces. Nonetheless, media forces also play a role in the operation of associations.

Community problems/ conflicts are identified with direct responses to possible issues (were collected from pre-survey deep interviews with local residents). Speculated inharmonious issues in this study include seven pointed aspects and one open aspect: they are noisy, hygiene habits, keeping pets, privatizing public spaces, parking, personal viewpoints, moral character and other. Each matter has been dichotomized using the categories "yes" and "no", the marked answer is valued as 1 and the unmarked answer as '0'.

Neighbourly behaviour refers to both providing assistance and receiving help from neighbours. Generally in the empirical study the concept is interpreted into possible daily actions: Do you watch a neighbour's house while they are away? Do you loan food or a tool from neighbours? Do you help them in an emergency? Do you advise them on personal problems? Or have you received any of the above help? (Perkins et al., 1990). Although predictors based on objective questions provide reliable data on interactions between neighbours, they may lead to a false result that is not trustworthy. For instance, when the trust of a responder concentrates only on one or two people, no matter to what degree isolated from other neighbours he/she is the answer would obtain in a very high score and would positively contribute to the result. However, this result may betray the true meaning of neighbourly behaviour. In essence, neighbourly behaviour is a subjective assessment which is closely linked to personal perceptions. Asking the respondents direct questions regarding their feelings enables us to avoid making this mistake. Therefore, we applied a subjective inquiry with a five-item scale: 'What do you think of the mutual care between neighbours within the community? The range was designed from the most negative level "very bad", rising to "bad, people are indifferent", "so-so, we get along harmoniously but not frequently", "quite good, we solve common problems together", and to the most positive level "very good, we help each other".

In terms of the five determinants of social participation examined, demographic characteristics, built environment, transient environment (symbols of incivility & territoriality) and social climate were assumed to jointly influence residents' behaviours in terms of presence in community organizations and in related social activities. They addressed the transient physical environment and social climate as the most proximate indicators of collective participation. The connotations of transient physical environment correspond to the elements of the concept "physical integration", and social climate here, also called perception, can be accounted for equally by the construct of psychological integration. The conceptual determinants of social climate consist of fear of crime, community problems, sense of community, communitarianism, community satisfaction, organizational efficacy, neighbouring and informal social control. The indicators involved have supplemented some valid ideas to define psychological integration and have enriched its dimension. However, this framework is too complicated to implement. Even in their own examination, repeatedly using similar questions in different concepts blurred our views and made it harder to identify integration. In order to avoid losing conceptual work, our study rather chose the main structure of Aubry and Myner (1996) and then regrouped the secondary indicators of Perkins et al. (1990) into it as supplementary.

Because the dimensions of community problems, neighbourly behaviour and organizational efficacy, were grouped into the concept of "sense of community", we selected the elements "fear of crime" and "community problems" as the indicators of social climate. Our study recently investigated direct victimization experiences (the occurrence of diverse community crimes/violence-related problems) of each responder in the past year. The questions comprise "been beaten

up", "been cheated of property", "been stolen", "been threatened" and "been robbed" were designed as dichotomous variables with two-item answers "yes" and "no".

The base data were collected using questionnaires and personal interviews. The main approach to examining social integration and psychological integration was statistical analyses in terms of frequencies and cross tables. Neighbourhood integration goes beyond numbers and mathematical indices of the population; demographic features, social networks, mental perceptions and investment, and emotional connections also act as significant determinants (Rich, 2009). To identify the determinants that may impact on integration, this study selected regression analysis to define them. The conceptualized factors include nine aspects: location of community, constructed time of community, the size of community, the dwelling mode of community, age, gender, educational background, income level and family type.

## 11 Neighbourhood integration of social housing communities

The common perception of the weak economic ability of social housing projects in Chinese cities is related to the highly concentrated residence of low- and middle-income families. In addition, several negative neighbourhood effects are highlighted like the lack of adequate employment (Kain, 1968), lack of representation in policy networks (Wilson, 1987), and insufficient access to various facilities (Porta et al., 2009; Wang, Mo et al. 2011; Diez et al. 2007; Moore et al., 2008a; Moore et al. 2008b; Farhan and Murray, 2005 and Zhang et al. 2011). Discussions have also expanded around the social effects of the households of public housing (Kontonkosta, 2013 and Chaskin, 2013). Does the targeted group integrate socially into the local environment and/or is it accepted by the surrounding residential units? Has the targeted group successfully formed social connections with neighbours or spatially proximate people? In this section, the measurement commenced with psychological integration and social integration (Aubry et al., 1996 and Aubry et al., 2016) to respond the question whether residents of social housing communities have been socially incorporated. Furthermore, the study explores both the positive and negative influences that affected the integration process, and the implications that can be attained from these phenomena.

### 11.1 Social integration

Drawing from the conceptualized topics on social integration, the broad connotations and unclear research topics have complicated the theoretical structure. By simplifying overlapping investigations, two dimensions (social participation/social functioning and social communication) have been extracted in this study. Consequently, the 660 questionnaires administered in 13 social housing communities were used to test social integration.

#### 11.1.1 Social participation/social functioning

Participation is the main component of the social cohesion paradigm, and is widely perceived to be an incorporated dimension of neighbourhood integration. For instance, in four dimensions conceptualized by Landecker (1951), participation is the central idea of “communicative integration” (the other three are cultural integration, normative and functional integration respectively). Participation incorporates patterns of social visiting, frequency of personal contacts and contributions in organized groups (Landecker, 1951). Ruiz-Tagle (2013), in his theory of socio-spatial integration, classified participation into the relational category of the four dimensions of measurement. At the same time, the secondary question suggested in Dijkers (2004) “community integration” refers to performance or participation in specific activities. In addition, the VALCOS index (Dickes et al., 2009) takes political participation and sociocultural participation into consideration in order to measure social cohesion scores. The importance of the predictor “participation” has been likewise emphasized in other theoretical frameworks relating the issues of “neighbourhood integration” (Landecker, 1951; Ruiz-Tagle, 2013; Townsend and Ryan, 1991; Dijkers, 2004) and social cohesion (Acket et al., 2011; Berger-Schmitt, 2000; Rajulton et al., 2007). Although participation is incorporated into specially named dimensions in distinct theoretical systems, the indispensable role of this index in any investigation of neighbourhood integration is recognized. The results generally reflect positive correlations between the participation and the social integration (Acket, 2011; Schiefer and Noll, 2017). This positive result may indicate that higher engagement in either the sociocultural or the political activities strengthens the ties with public life (e.g. sense of belonging, solidarity, cooperation) and political organizations (e.g. associations, political parties, unions, or non-governmental organizations).

According to the structure that is generally applied in these theoretical constructs, the measurement of the social participation of residents in social housing communities here takes two directions. One is the participation of social housing residents in political activities and the other is engagement in sociocultural activities (e.g. sports, recreational activities, outdoor leisure activities, donations or volunteering activities). On the basis of the main questions used in previous tests and our survey results from 660 respondents in 13 communities, this study respectively selected nine sub-predictors and eight sub-predictors to identify how residents joined in activities pertaining to these two aspects (see Tab.11.1). The survey investigated respondents about their frequency of contact with nine formal political organizations listed (i.e. social housing office of Guangzhou, Guangzhou municipal civil affairs bureau, district street office, district neighbourhood committee, property company, local police station, district volunteers’ organization, and district owner committee, media), and about their participations in eight spontaneous activities in the community (i.e. election of the

community neighbourhood committee, election of the community owner committee, cultural activities of the community centre, recreational activities of the community centre, community volunteering activities, spontaneous community donation activities, outdoor leisure activities, and discussions on community building issues online or in meetings).

The sub-indices are drawn directly from the survey results relating to questions E1-E9 and E10-E17. Each question comprise five categories which allowed respondents to choose the most fitting answer. The five incorporated categories are mutually independent but sorted in a descending order. The five-point scale in questions E1-E9 about the frequency of contacting organizations comprises “very often”, “often”, “normal”, “rarely” and “never”, and questions E10-E17 on the regularity in joining community activities comprises “every time”, “often”, “sometimes”, “rarely” and “never”. This study aims to find out what may cause differences between the surveyed residents on social participation in organizations’ activities and sociocultural activities. There are two main approaches employed to seek the potential influences, one is a quantitative method whereby regression is calculated, and the other one is a qualitative method by conceptualizing possible factors. However, binary logistic regression requires a dummy dependent variable and multinomial logistic regression also has limits on the number of categories of dependent variables.

The five-category questions of the sub-indicators do not fulfil the basic requirements of logistic regression. At the same time, the results of sub-indices are difficult to merge into the main index in the form of a binary variable. Certain information pertaining to the original data may be lost during the transition. In order to retain valid information, analysis of participation makes use of cross tables to show the relationships between the conceptualized factors (e.g. age, gender, employment, residence length, family type, income, educational background and community) and the sub-indices (see Tab.11.1). The potential factors are structured in line with three dimensions: personal information, residential environment and social identity. Personal information includes the age of the respondent, gender, educational background, family income and employment. Residential environment mainly refers to the features of the community in which the respondents live, i.e. the location, size, mixed type and construction time. In respect of the type of family in relation to social identity is divided into six groups: low-income family; low insurance household; poor household; widowed, elderly, disabled, veteran’s relatives etc.; special families; ordinary family and other. The following analysis utilized cross tables to demonstrate what the effect that the conceptualized factors may produce on social participation, expressed in percentages and numbers of surveyed people in the sub-categories of the indicator.

**Tab. 11.1 The weight of the main indices and sub-indices of social participation**

Index 1	Sub-index 1	Index 2	Sub-index 2
<b>Political participation</b>	1. Contact with the social housing office of Guangzhou	<b>Sociocultural participation</b>	1. Join the election of the community neighbourhood committee
	2. Contact with the Guangzhou municipal civil affairs bureau		2. Join the election of the community owner committee
	3. Contact with the district street office		3. Join the cultural activities of the community centre (studies of interest or skills etc.)
	4. Contact with the district neighbourhood committee		4. Join the recreational activities of the community centre (singing, dancing etc.)
	5. Contact with the property company		5. Join the community volunteering activities (helping others)
	6. Contact with the local police station		6. Join the spontaneous community donation activities
	7. Contact with the district volunteers’ organization		7. Join the outdoor leisure activities (morning exercises, fitness etc.)
	8. Contact with the district owner (Eigentümer) committee		8. Join the discussions on community building issues online or in meetings
	9. Contact with the media		

Source: own draft, 2019.

#### 11.1.1.1 Political participation

Of the nine organizations considered here (see Tab.11.2), the first two are at city level, the media is a public organization, and the other six organizations are positioned at the community level. The social housing office of Guangzhou, the prominent political organization, a functional department in the Guangzhou Bureau of Land Resource and Housing (GBLH), is responsible for the affairs of the social housing system in the city of Guangzhou. The

organization consists of several operational departments which are classified by their functions during the construction of social housing projects (GBLH, 2013). These secondary departments are listed in line with the development process; namely, the land collection and reservation department (*Zheng Shou Chu Bei Chu*), the project preparation department (*Qian Qi Chu*), the project management department (*gong cheng guan li chu*), the housing management department (*Zhu Fang Guan Li Chu*), the service centre (*Shi Wu Zhong Xin*), the coordination department (*Fang Gai Zhi Dao Chu*), the personal department (*Ren Shi Chu*), the general department (*Zong he Chu*), the financial management department (*Zi Jin Cai Wu Chu*) and the contact administrative department (*He Tong Guan Li Chu*). As shown above, the office is an important organization that functions as policy maker, executor of social housing project construction and control, and the manager of housing allocation and transition. The Guangzhou Civil Affairs Bureau (GCAB) is a city-level political organization. The main work of this bureau is to collect and control information on citizens' living conditions. Thus, personal data on economic ability and social identity are used to guarantee basic living conditions for urban residents in Guangzhou. Therefore, this organization defines the type of family. For instance, a family with a monthly income lower than 1,300 yuan (GCAB, 2012) would be classified as a low-income family that qualifies to applying for low-rent housing. Therefore, residents' living conditions in social housing communities are linked to the management of this municipal organization.

The district street office is a locally based management centre of city government. Any matters regarding physical construction in the governed area or to sociocultural activities of the citizens involved form part of the responsibilities of the district street office. The district neighbourhood committee, which is located in the sub district of the geographic unit, is the secondary organization of the GCAB. All residents who live in the specific sub district unit are directly managed by the local neighbourhood committee. The property company is mainly responsible for maintenance work on public facilities in communities, residential buildings and houses. The local police station acts as the security division to maintain personal safety and manage conflict. The district owner committee is a spontaneous group launched by residents who own the housing ownership. This committee is usually community-based and all owners involved are allowed to join. Representative members of the group are responsible for voicing the demands of owners and negotiating with political organizations about their rights and benefits. Like the district owner committee, the district volunteers' organization is a grassroots organization that was formed autonomously.

**Tab. 11.2 Overview of surveyed social housing residents' contact frequency with political organizations**

Organizations	Frequency		Never		Rarely		Normal		Often		Very often		Total	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Social housing office of Guangzhou	231	35.0	269	40.8	106	16.1	30	4.5	24	3.6	660	100.0		
Guangzhou municipal civil affairs bureau	265	40.2	260	39.4	91	13.8	27	4.1	17	2.6	660	100.0		
District street office	143	21.7	229	34.7	208	31.5	58	8.8	22	3.3	660	100.0		
District neighbourhood committee	104	15.8	203	30.8	225	34.1	107	16.2	21	3.2	660	100.0		
Property company	91	13.8	186	28.2	231	35.0	130	19.7	22	3.3	660	100.0		
Local police station	335	50.8	228	34.5	78	11.8	12	1.8	7	1.1	660	100.0		
District volunteers' organization	286	43.3	230	34.8	97	14.7	31	4.7	16	2.4	660	100.0		
District owner (Eigentümer) committee	342	51.8	197	29.8	93	14.1	23	3.5	5	0.8	660	100.0		
Media	454	68.8	156	23.6	34	5.2	7	1.1	9	1.4	660	100.0		

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Questions E1-E9 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

As shown in Tab.11.2, a total of 660 social housing residents participated our survey. Frequency of contact with organizations has been classified into five categories: from low to high, these are respectively "never", "rarely", "normal", "often" and "very often". In terms of the number and percentage in regard to the five categories of contact frequency, nine items can be basically regrouped into three. The first group, including property company, district neighbourhood committee and district street office, shows the highest level of contact among the surveyed residents. As may be seen from Tab.11.2, over 30% of respondents selected frequency "normal" (35.0%, 34.1% and 31.5% respectively); further 19.7%, 16.2% and 8.8% of surveyed people often visit these three organizations and 3.3%, 3.2% and 3.3% of them visit very often. In contrast, the numbers in the negative categories "never" and "rarely" with respect to contact with these three organizations are much lower. Only 13.8%, 15.8% and 21.7% of respondents never go to the three organizations, while 28.2%, 30.8% and 34.7% of respondents rarely communicate with them. Compared with the results

for the other six organizations, at least 70% of respondents opted for the categories “never” and “rarely”. This notable gap imply that residents in social housing communities may have closer relationships with locally based, official service groups that concern themselves with residents’ daily needs than with any other political organizations at city level or at community level.

The contact frequency of respondents with the other three organizations (i.e. the Guangzhou social housing office, the Guangzhou municipal civil affairs bureau, and the district volunteers’ organization) are lower than with the organizations in first group. We defined these three organizations as the second group. Accordingly, 35.0% and 40.8% of respondents indicated the category “never” and “rarely” regarding contact frequency with the Guangzhou social housing office. The percentages of respondents who never visit the Guangzhou municipal civil affairs bureau and the volunteers’ organization are 40.2% and 43.3 respectively, and 39.4% and 34.8% of respondents stated that they rarely visit these organizations. In addition, 16.1%, 13.8% and 14.7% of surveyed people chose the frequency of “normal”; 4.5%, 4.1% and 4.7% respondents indicated communications with the three organizations as “often”; and 3.6%, 2.6% and 2.4% of respondents judged their contact frequency as “very often”. Compared with the results pertaining to the three organizations in the first group, these three organizations demonstrate much higher instances of “never” and “rarely” and much fewer instances of “normal” and “often”. The neighbourhood committee is the secondary department of the GCAB; similarly, the district street office is a subordinate organization set up by the city government at local areas; and the property company, chosen by the Guangzhou social housing office, is a community-based organization that acts as the main service centre for housing affairs. Differences in contact levels between the first group and the second group may reflect that in spite of same function, the locally based political organizations are functioning better than the city-level ones for residents of social housing communities within communities. In addition, contact with the district volunteers’ organization is a bit lower than with the other two city-level organizations. Although this organization is locally based, its function is more liberal and less linked to residents’ daily needs than the roles of the other two. Therefore, the outcomes indicate that residents’ contact with political organizations in social housing communities may positively influenced by their daily needs.

The last group comprises the other three organizations: the district owner committee, the local police station and the media. Surveyed residents responded very low contact occurrence, which is revealed by the significantly high percentages of the categories “never” and “rarely”. The proportions of respondents that selected these two categories are 51.8% and 29.8%, 50.8% and 34.5%, 68.8% and 23.6%, respectively. Furthermore, proportions of respondents selected “often” and “very often” are 3.5% and 0.8%, 1.8% and 1.1%, 1.1% and 1.4%, respectively. Nearly 80% of residents have little contact with the three organizations of this group. It would appear that residents of social housing communities very rarely take part in owner committees which may indicate many of them are not the owner of their current house. A certain number of them do not have the ownership of houses. Furthermore, the fewer connections indicated with the media may imply that social housing residents are not used to appear or present in the public domain. Drawing from the results of Tab.11.2, it would appear that residents in social housing communities may prefer to contact community-level political organizations, which are closely related to their daily lives. Significant gaps in participation in political organizations, which are located at different administrative levels or in different functions, may imply that political participation by social housing residents is uneven and strongly oriented to their daily needs.

In order to discover what elements may have an effect on the behaviour of residents in social housing, the following analyses (see Tab.11.3 – Tab.11.11) were cross tabulated with every pair of variables in a table. The identification of differences in the numbers and percentages in each category may suggest to us which variable will be effective for explaining political participation behaviour.

**Political participation by the living location.** To see Tab.11.4, the surveyed residents from 13 communities were classified into four groups in terms of their housing location. The western cluster includes a total of 140 surveyed residents from the communities of Fanghe, Guocun and Dang’en; the middle cluster contains 100 respondents from Jude community; the eastern cluster comprises 160 surveyed people from Tangde, Guangdan, Anxia and Tai’an communities; and the northern cluster has 260 respondents from Zede, Jinshazhou, Jide, Huize Yaxuan and Likang.



Tab. 11.3 Surveyed social housing residents' contact frequency with political organizations, by location

Organization	Frequency	Location	Western cluster		Middle cluster		Eastern cluster		Northern cluster	
			abs.	%	abs.	%	abs.	%	abs.	%
Social housing office of Guangzhou	never		49	35.0	28	28.0	62	38.8	92	35.4
	rarely		39	27.9	60	60.0	64	40.0	106	40.8
	normal		27	19.3	12	12.0	24	15.0	43	16.5
	often		13	9.3	0	0.0	5	3.1	12	4.6
	very often		12	8.6	0	0.0	5	3.1	7	2.7
Guangzhou municipal civil affairs bureau	never		62	44.3	27	27.0	76	47.5	100	38.5
	rarely		39	27.9	60	60.0	55	34.4	106	40.8
	normal		22	15.7	12	12.0	21	13.1	36	13.8
	often		13	9.3	0	0.0	3	1.9	11	4.2
	very often		4	2.9	1	1.0	5	3.1	7	2.7
District street office	never		25	17.9	13	13.0	50	31.3	55	21.2
	rarely		45	32.1	60	60.0	40	25.0	84	32.3
	normal		44	31.4	24	24.0	45	28.1	95	36.5
	often		15	10.7	3	3.0	19	11.9	21	8.1
	very often		11	7.9	0	0.0	6	3.8	5	1.9
District neighbourhood committee	never		15	10.7	9	9.0	41	25.6	39	15.0
	rarely		40	28.6	46	46.0	39	24.4	78	30.0
	normal		47	33.6	38	38.0	51	31.9	89	34.2
	often		33	23.6	6	6.0	21	13.1	47	18.1
	very often		5	3.6	1	1.0	8	5.0	7	2.7
Property company	never		17	12.1	5	5.0	39	24.4	30	11.5
	rarely		42	30.0	31	31.0	36	22.5	77	29.6
	normal		44	31.4	52	52.0	52	32.5	83	31.9
	often		29	20.7	12	12.0	27	16.9	62	23.8
	very often		8	5.7	0	0.0	6	3.8	8	3.1
Local police station	never		74	52.9	30	30.0	86	53.8	145	55.8
	rarely		44	31.4	64	64.0	49	30.6	71	27.3
	normal		15	10.7	5	5.0	22	13.8	36	13.8
	often		6	4.3	1	1.0	1	0.6	4	1.5
	very often		1	0.7	0	0.0	2	1.3	4	1.5
District volunteers' organization	never		56	40.0	29	29.0	79	49.4	122	46.9
	rarely		46	32.9	61	61.0	44	27.5	79	30.4
	normal		23	16.4	10	10.0	26	16.3	38	14.6
	often		10	7.1	0	0.0	8	5.0	13	5.0
	very often		5	3.6	0	0.0	3	1.9	8	3.1
District owner (Eigentümer) committee	never		85	60.7	30	30.0	83	51.9	144	55.4
	rarely		33	23.6	54	54.0	41	25.6	69	26.5
	normal		14	10.0	14	14.0	27	16.9	38	14.6
	often		6	4.3	2	2.0	7	4.4	8	3.1
	very often		2	1.4	0	0.0	2	1.3	1	0.4
Media	never		102	72.9	52	52.0	112	70.0	188	72.3
	rarely		25	17.9	44	44.0	34	21.3	53	20.4
	normal		8	5.7	4	4.0	11	6.9	11	4.2
	often		4	2.9	0	0.0	1	0.6	2	0.8
	very often		1	0.7	0	0.0	2	1.3	6	2.3
<b>Subtotal</b>			<b>140</b>	<b>100.0</b>	<b>100</b>	<b>100.0</b>	<b>160</b>	<b>100.0</b>	<b>260</b>	<b>100.0</b>

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities of Guangzhou (n = 660), Question E1-E9 (see in Appendices A.2). Surveyed by Chao, R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

By comparing the percentages among the four clusters, we find that there are no significant differences existed among the western cluster, the eastern cluster and the northern cluster, but there are differences in the middle cluster. The surveyed residents in the first three clusters present highly consistent results in regard to contact frequency with the nine listed organizations. However, respondents in the middle cluster show a much higher concentration on the answers "never" and "rarely". At the same time, the percentages of the answers "often" and "very often" from the middle cluster are distinctly lower than the percentages of the other three clusters. For instance, the respondents located in the middle cluster displayed 28.0% never and 60.0% rarely in contacting with the social housing office of Guangzhou, and no respondents chose the categories "often" and "very often". Respectively, respondents from the other three groups have 35.0%, 38.8%, 35.4% in the category "never", and 27.9%, 40.0%, 40.8% in category "rarely". Simultaneously, their percentages of "often" and "very often" are higher than the results of the middle cluster to different extent. Similar

outcomes are demonstrated by communication with the other eight organizations. The clear difference in surveyed residents in the middle cluster may indicate that people in Jude community show less political participation than other surveyed social housing residents. In addition, surveyed people in the western cluster demonstrate slightly higher contact frequency with organizations than people in the eastern cluster and the northern cluster. This fact can be identified from the fewer percentages in the categories “never” and “rarely” in the western cluster, and its higher percentages in the categories “often” and “very often”.

**Political participation by construction time of community.** In terms of the construction time of the social housing community, the 13 social housing communities regroup into three categories (see Tab. 11.4). The category of earliest built communities refers to Zede, Tangde, Jude and Jide, which were developed from 1998. These communities contain the initially proposed social housing types: ANJU housing and JIEKUN housing. They were later redeveloped during the second constructing turn of the social housing system after 2005. Therefore, communities in this group include all kinds of social housings. The longer development time may result in a more comprehensive residential environment than communities in the other two groups. The total number of surveyed residents in this category was 319. Communities built during the 2008–2010 period comprise Fanghe, Jinshazhou, Guocun, Tai’an, Dang’en and Likang, and the total number of people was surveyed 281. The communities constructed during this time are of two types: low-rent housing (LRH) and economically affordable housing (EAH). Among them, the communities of Fanghe, Jinshazhou, Guocun and Tai’an each comprise both housing types while the communities of Dang’en and Likang only have EAH. The last group “after 2010” refers to communities built after 2010 and incorporates three communities: Guangdan, Anxia and Huize Yaxuan. In total, 60 respondents belonging to this group were surveyed.

From the percentages of three groups on five scales pertaining to contact frequency, group “2008-2010” present a distinctly higher level of participation than the groups “1998” and “after 2010”. This fact is particularly clear in percentages in the categories “normal”, “often” and “very often”. Making use of the results pertaining to the Guangzhou social housing office, the proportion of “normal” is 21.7% in group “2008-2010”, and proportions are 10.3% and 20.0% respectively in the groups “1998” and “after 2010”. In addition, 7.8% and 5.7% of respondents in the group “2008-2010” define their contact as often and very often, but only 2.2% and 1.6% of group “1998” and 1.7% and 5.0% of group “after 2010” selected “often” and “very often”. This difference of group “2008-2010” is consistently exists in the results pertaining to the rest of the eight organizations. This phenomenon may indicate that residents in communities that were developed during 2008-2010 have stronger connections with political organizations.

Secondly, we tried to compare the results of group “1998” and group “after 2010”. Contact with the Guangzhou social housing office, the Guangzhou municipal civil affairs bureau and the media displays higher frequencies to the surveyed residents in new communities that were constructed after 2010. As we can see in Tab. 11.4, 38.3% and 35.0% of respondents in new built communities never or rarely get in touch with the Guangzhou social housing office, and 39.2% and 46.7% of respondents, slightly higher percentages, indicated that they never or rarely contact the organization. In addition, percentages of the categories “normal” and “very often” of the group “after 2010”, that is, 20.0% and 5.0% respectively, which exceed apparently the level of 10.3% and 1.6% of the group “1998”. Similarly, the responses to the connection with the GCAB also demonstrate a higher level among respondents from communities built after 2010. Accordingly, 38.3% and 40.0% of people chose the categories “never” and “rarely”; and 15.0%, 3.3% and 3.3% people chose the categories “normal”, “often” and “very often”. The numbers of surveyed people in communities constructed from 1998 are respectively 42.9%, 43.6%, 9.1%, 2.2% and 2.2% along the scale of “never” to “very often”.

However, the situation with the two groups reversed when contacting the other six organizations: the district street office, the district neighbourhood committee, the property company, the local police station, the district volunteers’ organization and the district owner committee. All six of these organizations operate at the community level and function as the smallest political units. Respondents from communities built in 1998 indicate closer contact with those locally based organizations than people from communities built after 2010. Compared with the group “after 2010”, the results of group “1998” show notably lower percentages in the categories “never” and “rarely”, and higher percentages in the

**Tab. 11.4 Surveyed social housing residents' contact frequency with political organizations, by construction time**

Organization	Frequency	Construct time		1998		2008-2010		After 2010	
		abs.	%	abs.	%	abs.	%		
Social housing office of Guangzhou	never	125	39.2	83	29.5	23	38.3		
	rarely	149	46.7	99	35.2	21	35.0		
	normal	33	10.3	61	21.7	12	20.0		
	often	7	2.2	22	7.8	1	1.7		
	very often	5	1.6	16	5.7	3	5.0		
Guangzhou municipal civil affairs bureau	never	137	42.9	105	37.4	23	38.3		
	rarely	139	43.6	97	34.5	24	40.0		
	normal	29	9.1	53	18.9	9	15.0		
	often	7	2.2	18	6.4	2	3.3		
	very often	7	2.2	8	2.8	2	3.3		
District street office	never	67	21.0	51	18.1	25	41.7		
	rarely	127	39.8	84	29.9	18	30.0		
	normal	94	29.5	99	35.2	15	25.0		
	often	26	8.2	31	11.0	1	1.7		
	very often	5	1.6	16	5.7	1	1.7		
District neighbourhood committee	never	49	15.4	29	10.3	26	43.3		
	rarely	107	33.5	79	28.1	17	28.3		
	normal	111	34.8	101	35.9	13	21.7		
	often	42	13.2	61	21.7	4	6.7		
	very often	10	3.1	11	3.9	0	0.0		
Property company	never	43	13.5	25	8.9	23	38.3		
	rarely	92	28.8	81	28.8	13	21.7		
	normal	125	39.2	90	32.0	16	26.7		
	often	51	16.0	71	25.3	8	13.3		
	very often	8	2.5	14	5.0	0	0.0		
Local police station	never	169	53.0	128	45.6	38	63.3		
	rarely	118	37.0	97	34.5	13	21.7		
	normal	28	8.8	41	14.6	9	15.0		
	often	2	0.6	10	3.6	0	0.0		
	very often	2	0.6	5	1.8	0	0.0		
District volunteers' organization	never	136	42.6	109	38.8	41	68.3		
	rarely	121	37.9	98	34.9	11	18.3		
	normal	41	12.9	48	17.1	8	13.3		
	often	16	5.0	15	5.3	0	0.0		
	very often	5	1.6	11	3.9	0	0.0		
District owner (Eigentümer) committee	never	156	48.9	145	51.6	41	68.3		
	rarely	115	36.1	72	25.6	10	16.7		
	normal	36	11.3	48	17.1	9	15.0		
	often	10	3.1	13	4.6	0	0.0		
	very often	2	0.6	3	1.1	0	0.0		
Media	never	221	69.3	192	68.3	41	68.3		
	rarely	86	27.0	60	21.4	10	16.7		
	normal	8	2.5	17	6.0	9	15.0		
	often	2	0.6	5	1.8	0	0.0		
	very often	2	0.6	7	2.5	0	0.0		
<b>Subtotal</b>		<b>319</b>	<b>100.0</b>	<b>281</b>	<b>100.0</b>	<b>60</b>	<b>100.0</b>		

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities of Guangzhou (n = 660), Question E1-E9 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

categories “normal”, “often” and “very often”. To conclude the phenomena related to these two groups, people in communities built in 1998 may have less contact with city-level organizations than people in communities built after 2010. However, in interacting with locally based organizations, surveyed people in old communities show higher contact than newly built communities. This may imply the length of development time may positively affect residents' local political participation. The newly developed communities may establish a better way for residents to participate in city-level political activities.

**Political participation by the scale of community.** The respondents from the 13 surveyed communities were divided into three groups in terms of the size of their residential communities. As shown in Tab.11.5, communities with over 4000 residents are defined as the large-scale neighbourhoods. These include Zede, Fanghe, Jinshazhou and Guangdan and had a total of 319 respondents. In addition, included residents living in communities ranging from, 1500–3000 residents were labelled medium-scale. This group, which included Jude, Tangde, Jide and Anxia, comprised 240 surveyed people. Small-scale communities refer to those with less than 1500 persons. Guocun, Tai'an, Dang'en, Huize Yaxuan and Likang belong to this group and 101 residents from them were investigated.

As shown in Tab.11.5, we can see the large communities tend to be more positive than the medium and the small communities about contacting the nine organizations. With respect to communications with the Guangzhou social housing office, 19.4%, 6.3% and 5.0% of respondents of large communities indicated a frequency of “normal”, “often” and “very often”; and slightly fewer percentages were indicated by surveyed people in small-scale and medium-scale communities at 13.9%, 5.9%, 5.0% and 12.5%, 1.7% and 1.3% respectively. Similar results are shown in terms of contact with the Guangzhou municipal civil affairs bureau. The percentages of respondents who selected the negative categories “never” and “rarely” are separately: 38.6% and 35.4% in large-scale communities, 38.3% and 47.9% in middle-scale communities, and 49.5% and 31.7% in small-size communities. Conversely, slightly higher percentages are shown by the group “big scale” than the groups “medium scale” and “small scale” in terms of the positive answers “normal” “often” and “very often”. As to contact with the community-level administrative office (i.e. district street office, district neighbourhood committee), respondents from big communities still show more contact than those from smaller communities, though this gap has decreased to some extent. To conclude on these findings, the size or scale of the social housing community may have some effect on participation in governmental organizations. Surveyed people in large-scale communities indicate that they take the initiative in participation while people from medium-size communities appear to have the lowest contact frequency.

However, there is a notable decrease in contact frequency with the district volunteers' organization and the district owner committee as the size of the community decreases. Both of these organizations are autonomously established organizations. Compared to respondents from smaller communities, people from larger communities demonstrate higher percentages on positive categories. To take the results of visiting the district volunteers' organization as an example, the percentages of the category “normal” are 19.4%, 12.1%, 5.9% respectively for the respondents from big to small communities, proportions of the answer “often” are 6.3%, 2.9% and 4.0% respectively, and the results of the answer “very often” are 4.1%, 1.3% and 0.0% respectively. At the same time, respectively results of the contact with the district owner committee display a similar phenomenon. In regard to the percentages of large-scale, medium-scale and small-scale communities, respectively 16.9%, 13.8%, 5.9% of their respondents go for the answer “normal”; 3.8%, 3.8% and 2.0% go for the category “often”; and 0.9%, 0.8% and 0.0% choose the answer “very often”. This implies that the participation behaviour of residents in social housing communities, particularly in autonomous or grassroots activities, may be influenced by the size of the neighbourhood. The larger the community is (with more neighbours), the greater the possibility that residents may take part in spontaneous political activities. Nevertheless, there are no significant differences between the three kinds of communities about contact with the property company. Therefore, communication with the community-based organization, whose function is closely linked to daily life and basic needs, may be less influenced by the objective environment of the community.

Tab. 11.5 Surveyed social housing residents' contact frequency with political organizations, by scale

Organization	Frequency	Scale		Big scale (>4000 person)		Medium scale (1500-3000 person)		Small scale (<1500 person)	
				abs.	%	abs.	%	abs.	%
Social housing office of Guangzhou	never			104	32.6	84	35.0	43	42.6
	rarely			117	36.7	119	49.6	33	32.7
	normal			62	19.4	30	12.5	14	13.9
	often			20	6.3	4	1.7	6	5.9
	very often			16	5.0	3	1.3	5	5.0
Guangzhou municipal civil affairs bureau	never			123	38.6	92	38.3	50	49.5
	rarely			113	35.4	115	47.9	32	31.7
	normal			53	16.6	26	10.8	12	11.9
	often			21	6.6	3	1.3	3	3.0
	very often			9	2.8	4	1.7	4	4.0
District street office	never			63	19.7	54	22.5	26	25.7
	rarely			99	31.0	104	43.3	26	25.7
	normal			113	35.4	60	25.0	35	34.7
	often			29	9.1	19	7.9	10	9.9
	very often			15	4.7	3	1.3	4	4.0
District neighbourhood committee	never			50	15.7	38	15.8	16	15.8
	rarely			82	25.7	86	35.8	35	34.7
	normal			107	33.5	85	35.4	33	32.7
	often			68	21.3	24	10.0	15	14.9
	very often			12	3.8	7	2.9	2	2.0
Property company	never			38	11.9	33	13.8	20	19.8
	rarely			96	30.1	64	26.7	26	25.7
	normal			98	30.7	101	42.1	32	31.7
	often			73	22.9	36	15.0	21	20.8
	very often			14	4.4	6	2.5	2	2.0
Local police station	never			167	52.4	104	43.3	64	63.4
	rarely			86	27.0	109	45.4	33	32.7
	normal			51	16.0	23	9.6	4	4.0
	often			10	3.1	2	0.8	0	0.0
	very often			5	1.6	2	0.8	0	0.0
District volunteers' organization	never			133	41.7	96	40.0	57	56.4
	rarely			91	28.5	105	43.8	34	33.7
	normal			62	19.4	29	12.1	6	5.9
	often			20	6.3	7	2.9	4	4.0
	very often			13	4.1	3	1.3	0	0.0
District owner (Eigentümer) committee	never			174	54.5	100	41.7	68	67.3
	rarely			76	23.8	96	40.0	25	24.8
	normal			54	16.9	33	13.8	6	5.9
	often			12	3.8	9	3.8	2	2.0
	very often			3	0.9	2	0.8	0	0.0
Media	never			226	70.8	149	62.1	79	78.2
	rarely			59	18.5	78	32.5	19	18.8
	normal			21	6.6	10	4.2	3	3.0
	often			6	1.9	1	0.4	0	0.0
	very often			7	2.2	2	0.8	0	0.0
<b>Subtotal</b>				<b>319</b>	<b>100.0</b>	<b>240</b>	<b>100.0</b>	<b>101</b>	<b>100.0</b>

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities of Guangzhou (n = 660), Question E1-E9 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Political participation by the mixed type of communities.** In terms of mixed type, the study has regrouped the 13 communities into three categories (see Tab.11.6). The communities developed from 1998 contain all kinds of social housing types. Because of ongoing housing construction, policy changes, and the transfer of housing ownership, residents living in these communities may show a higher degree of mixing. In some areas of the community, households with different social identities (e.g. low-income family, low-insurance household, poor household, common family) and

Tab. 11.6 Surveyed social housing residents' contact frequency with political organizations, by mixed type

Organization	Frequency	Mixed type		Fully mixed <sup>a</sup>		Half-mixed <sup>b</sup>		Single <sup>c</sup>	
		abs.	%	abs.	%	abs.	%	abs.	%
Social housing office of Guangzhou	never	125	39.2	75	28.8	31	38.3		
	rarely	149	46.7	90	34.6	30	37.0		
	normal	33	10.3	61	23.5	12	14.8		
	often	7	2.2	18	6.9	5	6.2		
	very often	5	1.6	16	6.2	3	3.7		
Guangzhou municipal civil affairs bureau	never	137	42.9	94	36.2	34	42.0		
	rarely	139	43.6	87	33.5	34	42.0		
	normal	29	9.1	54	20.8	8	9.9		
	often	7	2.2	17	6.5	3	3.7		
	very often	7	2.2	8	3.1	2	2.5		
District street office	never	67	21.0	48	18.5	28	34.6		
	rarely	127	39.8	77	29.6	25	30.9		
	normal	94	29.5	89	34.2	25	30.9		
	often	26	8.2	30	11.5	2	2.5		
	very often	5	1.6	16	6.2	1	1.2		
District neighbourhood committee	never	49	15.4	37	14.2	18	22.2		
	rarely	107	33.5	64	24.6	32	39.5		
	normal	111	34.8	90	34.6	24	29.6		
	often	42	13.2	58	22.3	7	8.6		
	very often	10	3.1	11	4.2	0	0.0		
Property company	never	43	13.5	27	10.4	21	25.9		
	rarely	92	28.8	71	27.3	23	28.4		
	normal	125	39.2	83	31.9	23	28.4		
	often	51	16.0	66	25.4	13	16.0		
	very often	8	2.5	13	5.0	1	1.2		
Local police station	never	169	53.0	119	45.8	47	58.0		
	rarely	118	37.0	82	31.5	28	34.6		
	normal	28	8.8	44	16.9	6	7.4		
	often	2	0.6	10	3.8	0	0.0		
	very often	2	0.6	5	1.9	0	0.0		
District volunteers' organization	never	136	42.6	103	39.6	47	58.0		
	rarely	121	37.9	83	31.9	26	32.1		
	normal	41	12.9	50	19.2	6	7.4		
	often	16	5.0	13	5.0	2	2.5		
	very often	5	1.6	11	4.2	0	0.0		
District owner (Eigentümer) committee	never	156	48.9	136	52.3	50	61.7		
	rarely	115	36.1	59	22.7	23	28.4		
	normal	36	11.3	51	19.6	6	7.4		
	often	10	3.1	11	4.2	2	2.5		
	very often	2	0.6	3	1.2	0	0.0		
Media	never	221	69.3	177	68.1	56	69.1		
	rarely	86	27.0	50	19.2	20	24.7		
	normal	8	2.5	21	8.1	5	6.2		
	often	2	0.6	5	1.9	0	0.0		
	very often	2	0.6	7	2.7	0	0.0		
<b>Subtotal</b>		<b>319</b>	<b>100.0</b>	<b>260</b>	<b>100.0</b>	<b>81</b>	<b>100.0</b>		

Note: <sup>a</sup> Fully mixed community refers to an old neighbourhood built from 1998 which contains all kinds of social housing (low-rent housing, affordable housing, ANJU housing and JIEKUN housing), residents in different housing types may live next door to each other. <sup>b</sup> A half-mixed community means a neighbourhood built after 2008, with only two types of housing: low-rent housing and affordable housing. The two types of housing are built in different large buildings and are spatially independent of each other. <sup>c</sup> A single community is the neighbourhood with only affordable housing.

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities of Guangzhou (n = 660), Question E1-E9 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

in different housing types (e.g. LRH, EAH) may live in the same building or even next door to each other. Therefore, we renamed this kind of community as “fully mixed”. In addition, communities developed after 2005 only contain two housing types: LRH and EAH. The developer at this time suggested designing independent buildings according to residents’ needs and constructed two kinds of housing on different land parcels. Therefore, social housing communities directed by this notion have been renamed as the half-mixed type. Accordingly, inhabitants of these communities are physically incorporated in a neighbourhood, but are spatially separated by buildings.

To have an overview of the percentages indicated for the three community categories, the half-mixed community presents a higher level of participation than other mixed types. A gap is indicated with the lower rates in the categories “never” and “rarely”, and higher percentages in the categories “normal”, “often” and “very often”. Apart from this notable distinction of the half-mixed community on all levels of participation indicated here, the difference between the “single community” and the “fully mixed community” is changeable and should be discussed together with the detailed activities. As we know, the nine organizations can be classified according to their functions and operative mechanisms. The first two organizations (see the rows of Tab.11.6) are city-level governmental agencies; the second two (i.e. the district street office, the district neighbourhood committee) are subordinate agencies that function in the local area. Meanwhile, the property company is a service organization that is physically attached to the residential community. In addition, the district volunteers’ organization and the district owner committee are spontaneous activities that have been launched in the local area. To compare the percentages of the categories “fully mixed” and “single” regarding the contact frequency with city-level organizations, the latter displays higher rates on positive categories. For example, as to the judgement of contact with the social housing office, 14.8% of respondents in “single community” selected “normal”, 6.2% selected “often” and 3.7% chose “very often”. The percentages relating to “fully mixed community” are respectively 10.3%, 2.2% and 1.8%, which present at a lower level. However, as to participation in any other locally based political organizations, two communities show a reverse situation. Based on these percentages, we can discover that the contact frequency of the group “fully mixed” stays at a higher level than the situation of the group “single”. Therefore, the mixing of housing types within a community may positively affect residents’ participation behaviour in local political activities. In particular, the new developed communities with two housing types, low-rent housing and affordable housing, have obvious advantages over the other older mixed type community and the single community with only affordable housing.

**Political participation by age.** Besides the possible influence of residential environment, political participation behaviour may relate to personal preference or household living conditions. By comparing the results of residents in terms of age, income, education and social identity, the study attempts to identify the influence that these factors may produce on contact with the city-level administration, local administrative agency and public service agency. In Tab.11.7, 660 surveyed people have been classified by age group: “<20”, “20-29”, “30-39”, “40-49”, “50-59” and “>=60”. The total number in each category reflects that most respondents are older and are concentrated in the last three groups; hence, 259 respondents fall into the 50-59 age group, 125 people are over the age of 60, and 109 people fall into the “40-49” age group.

However, the results shown in Tab.11.7 reveal that age is not a significant factor, as different age groups do not appear to indicate any differences with regard to political participation behaviour. Except for one respondent in group “<20”, there are no big gaps shown between the other five age groups regarding the percentages for the five scales. In general, the frequencies indicated by the people in the five groups are very similar, although some fluctuations appear regarding contact with different organizations. In connection with city-level administration (i.e. the Guangzhou social housing office of and the GCAB), older groups, “40-49” “50-59” and “>=60”, show slightly higher percentages on the categories “often” and “very often”. This advantage disappears when it comes to contact with other community-level organizations, and even falls in connection with the media. To conclude these findings, younger people who are not involved into ordinary city life, indicated a lack of political participation. Accordingly, age does not play an important role in residents’ behaviours of political participation. Particularly in participation that is related to daily needs, like contact with locally based administrative agencies or local services, no significant differences exist between the surveyed people in the five different age groups.



Tab. 11.7 Surveyed social housing residents contact frequency with political organizations, by age

Organization	Frequency	Age		<20		20-29		30-39		40-49		50-59		≥60	
		abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%		
Social housing office of Guangzhou	never	1	100.0	16	28.6	29	30.2	34	31.2	100	38.6	49	39.2		
	rarely	0	0.0	29	51.8	48	50.0	48	44.0	92	35.5	44	35.2		
	normal	0	0.0	9	16.1	13	13.5	21	19.3	42	16.2	18	14.4		
	often	0	0.0	0	0.0	3	3.1	2	1.8	16	6.2	9	7.2		
	very often	0	0.0	2	3.6	3	3.1	4	3.7	9	3.5	5	4.0		
Guangzhou municipal civil affairs bureau	never	1	100.0	17	30.4	31	32.3	40	36.7	113	43.6	59	47.2		
	rarely	0	0.0	31	55.4	47	49.0	48	44.0	86	33.2	40	32.0		
	normal	0	0.0	6	10.7	11	11.5	13	11.9	41	15.8	19	15.2		
	often	0	0.0	0	0.0	5	5.2	6	5.5	11	4.2	5	4.0		
	very often	0	0.0	2	3.6	2	2.1	2	1.8	8	3.1	2	1.6		
District street office	never	0	0.0	11	19.6	12	12.5	21	19.3	69	26.6	27	21.6		
	rarely	1	100.0	24	42.9	36	37.5	36	33.0	79	30.5	47	37.6		
	normal	0	0.0	15	26.8	35	36.5	37	33.9	80	30.9	37	29.6		
	often	0	0.0	5	8.9	10	10.4	10	9.2	24	9.3	9	7.2		
	very often	0	0.0	1	1.8	3	3.1	5	4.6	7	2.7	5	4.0		
District neighbourhood committee	never	0	0.0	10	17.9	7	7.3	18	16.5	46	17.8	20	16.0		
	rarely	1	100.0	17	30.4	34	35.4	29	26.6	81	31.3	36	28.8		
	normal	0	0.0	19	33.9	37	38.5	36	33.0	83	32.0	46	36.8		
	often	0	0.0	9	16.1	16	16.7	23	21.1	41	15.8	17	13.6		
	very often	0	0.0	1	1.8	2	2.1	3	2.8	8	3.1	6	4.8		
Property company	never	1	100.0	5	8.9	8	8.3	14	12.8	40	15.4	22	17.6		
	rarely	0	0.0	16	28.6	30	31.3	22	20.2	82	31.7	32	25.6		
	normal	0	0.0	23	41.1	32	33.3	43	39.4	83	32.0	45	36.0		
	often	0	0.0	11	19.6	22	22.9	26	23.9	46	17.8	23	18.4		
	very often	0	0.0	1	1.8	4	4.2	4	3.7	8	3.1	3	2.4		
Local police station	never	1	100.0	18	32.1	42	43.8	52	47.7	153	59.1	65	52.0		
	rarely	0	0.0	24	42.9	37	38.5	40	36.7	77	29.7	42	33.6		
	normal	0	0.0	12	21.4	13	13.5	13	11.9	23	8.9	16	12.8		
	often	0	0.0	1	1.8	3	3.1	3	2.8	4	1.5	1	0.8		
	very often	0	0.0	1	1.8	1	1.0	1	0.9	2	0.8	1	0.8		
District volunteers' organization	never	1	100.0	17	30.4	35	36.5	47	43.1	118	45.6	66	52.8		
	rarely	0	0.0	26	46.4	39	40.6	37	33.9	84	32.4	37	29.6		
	normal	0	0.0	7	12.5	16	16.7	18	16.5	39	15.1	14	11.2		
	often	0	0.0	4	7.1	3	3.1	5	4.6	11	4.2	8	6.4		
	very often	0	0.0	2	3.6	3	3.1	2	1.8	7	2.7	0	0.0		
District owner (Eigentümer) committee	never	1	100.0	21	37.5	40	41.7	57	52.3	150	57.9	70	56.0		
	rarely	0	0.0	27	48.2	35	36.5	35	32.1	61	23.6	34	27.2		
	normal	0	0.0	7	12.5	13	13.5	12	11.0	41	15.8	15	12.0		
	often	0	0.0	1	1.8	5	5.2	5	4.6	6	2.3	6	4.8		
	very often	0	0.0	0	0.0	3	3.1	0	0.0	1	0.4	0	0.0		
Media	never	1	100.0	26	46.4	61	63.5	70	64.2	192	74.1	99	79.2		
	rarely	0	0.0	26	46.4	25	26.0	29	26.6	49	18.9	21	16.8		
	normal	0	0.0	2	3.6	8	8.3	6	5.5	14	5.4	2	1.6		
	often	0	0.0	1	1.8	0	0.0	2	1.8	3	1.2	1	0.8		
	very often	0	0.0	1	1.8	2	2.1	2	1.8	1	0.4	2	1.6		
<b>Subtotal</b>		<b>1</b>	<b>100.0</b>	<b>56</b>	<b>100.0</b>	<b>96</b>	<b>100.0</b>	<b>109</b>	<b>100.0</b>	<b>259</b>	<b>100.0</b>	<b>125</b>	<b>100.0</b>		

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question E1-E9 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Political participation by gender.** As shown in Tab.11.8, 252 male respondents and 408 female respondents were included in the survey. The study sought to ascertain whether gender was a factor that might cause behaviour towards political participation to differ. By comparing the results obtained from the male and female participants about their contact frequency with nine organizations, we found that there was no significant difference between the two groups. Nearly every pair of percentages for the five frequency categories (i.e. 'never', 'rarely', 'normal', 'often' and 'very often') presents a comparable level.

Tab. 11.8 Surveyed social housing residents' contact frequency with political organizations, by gender

Organization	Frequency	Gender	Male		Female	
			abs.	%	abs.	%
Social housing office of Guangzhou	never		76	30.2	155	38.0
	rarely		112	44.4	157	38.5
	normal		41	16.3	65	15.9
	often		12	4.8	18	4.4
	very often		11	4.4	13	3.2
Guangzhou municipal civil affairs bureau	never		97	38.5	168	41.2
	rarely		99	39.3	161	39.5
	normal		33	13.1	58	14.2
	often		14	5.6	13	3.2
	very often		9	3.6	8	2.0
District street office	never		56	22.2	87	21.3
	rarely		89	35.3	140	34.3
	normal		74	29.4	134	32.8
	often		24	9.5	34	8.3
	very often		9	3.6	13	3.2
District neighbourhood committee	never		43	17.1	61	15.0
	rarely		82	32.5	121	29.7
	normal		75	29.8	150	36.8
	often		42	16.7	65	15.9
	very often		10	4.0	11	2.7
Property company	never		38	15.1	53	13.0
	rarely		65	25.8	121	29.7
	normal		91	36.1	140	34.3
	often		48	19.0	82	20.1
	very often		10	4.0	12	2.9
Local police station	never		125	49.6	210	51.5
	rarely		96	38.1	132	32.4
	normal		23	9.1	55	13.5
	often		5	2.0	7	1.7
	very often		3	1.2	4	1.0
District volunteers' organization	never		111	44.0	175	42.9
	rarely		87	34.5	143	35.0
	normal		37	14.7	60	14.7
	often		13	5.2	18	4.4
	very often		4	1.6	12	2.9
District owner (Eigentümer) committee	never		129	51.2	213	52.2
	rarely		70	27.8	127	31.1
	normal		40	15.9	53	13.0
	often		12	4.8	11	2.7
	very often		1	0.4	4	1.0
Media	never		173	68.7	281	68.9
	rarely		63	25.0	93	22.8
	normal		10	4.0	24	5.9
	often		2	0.8	5	1.2
	very often		4	1.6	5	1.2
<b>Subtotal</b>			<b>252</b>	<b>100.0</b>	<b>408</b>	<b>100.0</b>

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question E1-E9 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

In spite of the fact that some categories demonstrate a few disparities, the general result is still consistent with the conclusion of an approximate level. For example, with regard to contact with the Guangzhou social housing office, 30.2% of surveyed males and 38.0% of surveyed females chose "never", and 44.4% of males and 38.5% of females answered "rarely". Because "never" and "rarely" are both negative answers, it is also valuable to calculate the sum of the percentages for the two answers. Therefore, the total percentages for the categories ("never" and "rarely") are 74.6% and 76.5% respectively. In addition, percentages for males and females on the other three categories, "normal"

“often” and “very often”, are 16.3% and 15.9%, 4.8% and 4.4%, 4.4% and 3.2%. Therefore, the male group and the female group demonstrate an equivalent contact frequency, which reveals that the gender does not appear to influence people’s political participation behaviour.

**Political participation by education level.** In terms of the educational level, the 660 people involved were classified into the groups “no education”, “primary school”, “middle school”, “high school and technical secondary school” “undergraduate study or junior college” and “other”. According to the highest completed educational level, the six groups are ranked in ascending order from low to high. To obtain an overview of the total number in each category, most respondents have finished middle school education or have attained the equivalent of high school education. There are 223 people and 266 people respectively in the groups “middle school” and “high school or technical secondary school”. Only 15 respondents were never educated, 77 people have primary school education and 78 people have completed undergraduate study or junior college. That is to say, the educational background of the surveyed people was mostly at a basic level, with the majority of people having attained a middle school or high school education.

In order to identify in detail the differences between people with various educational backgrounds, we discuss the results by the nine organizations individually. Firstly, we draw on the percentages indicated with regard to the Guangzhou social housing office. There is a clear drop in the percentages for the category “never” in the first two groups with less education (no education and primary school education) compared to the other three groups with a middle school and above educational background (middle school, high school or technical secondary school, and undergraduate study or junior college). Accordingly, 53.3% of people with no education and 49.4% of primary school educated people respectively answered “never”, and the numbers of people in three other groups with higher education are only 30.9%, 35.7% and 26.9%. The answer “rarely” also represents negative contact frequency to some extent. From “no education” to “undergraduate study”, the percentages are respectively 20.0%, 31.2%, 43.9%, 39.5% and 48.7% the. An obvious increasing trend appears along with increasing levels of education. However, in summing up the percentages of these two categories by educational level, the results are equivalent; that is, 73.3%, 81.6%, 74.8%, 75.2% and 75.6%. As to the answer “normal” and the other two positive answers “often” and “very often”, people in different groups responded in various way. The categories, “often” and “very often”, contain 3.9% and 5.2% people from the group “primary school”; 4.9% and 4.0% people from the group “middle school”; and 5.6% and 3.8% of respondents from the group “high school”. This means that the contact frequency of the surveyed residents with a middle school or high school educational background with the Guangzhou social housing office may be slightly higher than that of other educated people. In addition, similar differences appear in their contact with the next three administrative agencies, GCAB the district street office and the district neighbourhood committee. The difference between the people who were educated at primary school level or even lower and the people who attained education above the middle school level is significantly demonstrated. At the same time, the advantages of the group “middle school” are more recognizable. By comparing the results of the three groups (middle school, high school or technical secondary school, and undergraduate study or junior college), we find a decreasing trend in percentages of the categories of “often” and “very often” with a rise in education level (see Tab.11.9). This may imply that middle school educated residents have the closest connections with any related administrative agencies. Less educated people who only attained primary school education or no education at all appear to have fewer political connections.

Tab. 11.9 Surveyed social housing residents' contact frequency with political organizations, by level of education

Organization	Frequency	Education											
		No education		Primary school		Middle school		High school or technical secondary school		Undergraduate study or junior college		Other	
		abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Social housing office of Guangzhou	never	8	53.3	38	49.4	69	30.9	95	35.7	21	26.9	0	0.0
	rarely	3	20.0	24	31.2	98	43.9	105	39.5	38	48.7	1	100.0
	normal	3	20.0	8	10.4	36	16.1	41	15.4	18	23.1	0	0.0
	often	1	6.7	3	3.9	11	4.9	15	5.6	0	0.0	0	0.0
	very often	0	0.0	4	5.2	9	4.0	10	3.8	1	1.3	0	0.0
Guangzhou municipal civil affairs bureau	never	10	66.7	41	53.2	77	34.5	111	41.7	25	32.1	1	100.0
	rarely	3	20.0	24	31.2	89	39.9	103	38.7	41	52.6	0	0.0
	normal	1	6.7	6	7.8	39	17.5	35	13.2	10	12.8	0	0.0
	often	0	0.0	5	6.5	11	4.9	10	3.8	1	1.3	0	0.0
	very often	1	6.7	1	1.3	7	3.1	7	2.6	1	1.3	0	0.0
District street office	never	5	33.3	22	28.6	43	19.3	56	21.1	17	21.8	0	0.0
	rarely	4	26.7	27	35.1	72	32.3	99	37.2	27	34.6	0	0.0
	normal	5	33.3	17	22.1	74	33.2	83	31.2	28	35.9	1	100.0
	often	1	6.7	7	9.1	24	10.8	21	7.9	5	6.4	0	0.0
	very often	0	0.0	4	5.2	10	4.5	7	2.6	1	1.3	0	0.0
District neighbourhood committee	never	2	13.3	15	19.5	36	16.1	41	15.4	10	12.8	0	0.0
	rarely	7	46.7	26	33.8	61	27.4	79	29.7	30	38.5	0	0.0
	normal	4	26.7	20	26.0	74	33.2	97	36.5	29	37.2	1	100.0
	often	1	6.7	13	16.9	43	19.3	43	16.2	7	9.0	0	0.0
	very often	1	6.7	3	3.9	9	4.0	6	2.3	2	2.6	0	0.0
Property company	never	3	20.0	19	24.7	25	11.2	38	14.3	5	6.4	1	100.0
	rarely	5	33.3	16	20.8	67	30.0	78	29.3	20	25.6	0	0.0
	normal	3	20.0	27	35.1	74	33.2	96	36.1	31	39.7	0	0.0
	often	4	26.7	11	14.3	51	22.9	45	16.9	19	24.4	0	0.0
	very often	0	0.0	4	5.2	6	2.7	9	3.4	3	3.8	0	0.0
Local police station	never	7	46.7	47	61.0	109	48.9	142	53.4	29	37.2	1	100.0
	rarely	7	46.7	16	20.8	86	38.6	88	33.1	31	39.7	0	0.0
	normal	1	6.7	11	14.3	21	9.4	30	11.3	15	19.2	0	0.0
	often	0	0.0	3	3.9	4	1.8	3	1.1	2	2.6	0	0.0
	very often	0	0.0	0	0.0	3	1.3	3	1.1	1	1.3	0	0.0
District volunteers' organization	never	6	40.0	40	51.9	96	43.0	117	44.0	26	33.3	1	100.0
	rarely	7	46.7	24	31.2	77	34.5	91	34.2	31	39.7	0	0.0
	normal	0	0.0	8	10.4	35	15.7	40	15.0	14	17.9	0	0.0
	often	2	13.3	5	6.5	11	4.9	9	3.4	4	5.1	0	0.0
	very often	0	0.0	0	0.0	4	1.8	9	3.4	3	3.8	0	0.0
District owner (Eigentümer) committee	never	8	53.3	49	63.6	108	48.4	139	52.3	37	47.4	1	100.0
	rarely	5	33.3	17	22.1	64	28.7	83	31.2	28	35.9	0	0.0
	normal	1	6.7	9	11.7	36	16.1	36	13.5	11	14.1	0	0.0
	often	1	6.7	1	1.3	13	5.8	6	2.3	2	2.6	0	0.0
	very often	0	0.0	1	1.3	2	0.9	2	0.8	0	0.0	0	0.0
Media	never	10	66.7	60	77.9	148	66.4	185	69.5	50	64.1	1	100.0
	rarely	5	33.3	13	16.9	52	23.3	62	23.3	24	30.8	0	0.0
	normal	0	0.0	1	1.3	14	6.3	16	6.0	3	3.8	0	0.0
	often	0	0.0	2	2.6	4	1.8	1	0.4	0	0.0	0	0.0
	very often	0	0.0	1	1.3	5	2.2	2	0.8	1	1.3	0	0.0
<b>Subtotal</b>		<b>15</b>	<b>100.0</b>	<b>77</b>	<b>100.0</b>	<b>223</b>	<b>100.0</b>	<b>266</b>	<b>100.0</b>	<b>78</b>	<b>100.0</b>	<b>1</b>	<b>100.0</b>

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities of Guangzhou (n=660), Question E1-E9 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

We then examine the result related to certain locally based organizations. The property company, a service agency, is an organization that is physically located within the surveyed communities. With an increase in the level of education, there is a clear decline in "never" and a slight decline in the category "rarely", and the percentages of the categories "normal", "often" and "very often" demonstrate a rising trend. As a result, the more educated people are, the higher contact frequency with the property company they may have. Furthermore, this phenomenon also appears in the results

for the other two organizations: the local police station and the district volunteers' organization. The people in the group "undergraduate study or junior college" responded with the highest connections, which may be proven by the lowest percentages of answers "never" and "rarely" and the highest percentages of answers "normal", "often" and "very often". In addition, the answers given relating to the district owner committee and the media display a similar situation. Compared to the people with a lower than primary school education, people who have more than middle school education generally demonstrate higher percentages on positive categories in regard to contact frequency and lower percentages on negative answers. Nevertheless, ranking the contact frequency with these two organizations by group from high to low, they are "middle school", "high school" and "undergraduate study".

To conclude, there is a significant gap between people with education over the middle school and people with less educations below the level of primary school. The more educated people show greater political participation. Furthermore, people in the "middle school" group display the highest participation level in administrative agencies at both city-level and community-level. That is to say, above middle school, there is a descending trend in connection with administrative agencies as educational level increases. However, the reverse appears in connection with local service organizations like the property company, the volunteers' organizations and the police station. People in the higher education groups, particularly the "undergraduate study or junior college", present significantly higher frequencies in contacting locally based service organizations. This may reflect that the more educated a person is, the higher their participation with service agencies will be.

**Political participation by income level.** Because the majority of people investigated are economically weak citizens in Guangzhou, our study uses a small scale and classifies them by 1000 yuan (see Tab.11.10). By comparing the percentages of income groups on the five scales of frequency, it becomes clear that people with higher income may have less contact with administrative agencies (i.e. the Guangzhou social housing office of, the Guangzhou municipal civil affairs bureau, the district street office and the district neighbourhood committee). In terms of the results for these four agencies, it can be seen there are two clear gaps at income levels "2000 yuan" and "4000-5000yuan" respectively. This differences shows at the higher percentages on negative answers "never" and "rarely", and the lower percentages on positive answers "often" and "very often" of groups with a higher income level. We take the results of the Guangzhou municipal civil affairs bureau as an example. Only 30.3% people in group "<1000 yuan" responded that they never contact the organization. This number increases to 51.4% in the group ">7000 yuan". Similarly, the total proportion of "never" and "rarely" also displays the same growing trend, rising from 62.1% to 87.9%. At the same time, the percentages of categories "often" and "very often" demonstrate a decreasing trend. These are 13.6% and 7.6% respectively in the group "<1000", and this decreases to 0.0% and 0.0% in the group ">7000". This finding may indicate that people with higher income levels have less contact with government agencies, which are closely involved in social housing affairs. In addition, the results for the district volunteers' organization also display a gradual decrease in contact frequency as income increases. That means that lower-income residents may be more involved in local volunteer activities than higher-income residents.

As to contact with the property company, the local police station, the district owner committee and the media, the people surveyed in the different income groups do not present any big differences. Percentages of answers "never" and "rarely" remain at a more or less equal level. A slightly higher percentage of people from the higher income groups responded with "normal", while the percentages of "often" and "very often" display a slightly higher level in lower income groups than higher income groups.

Tab. 11.10 Surveyed social housing residents' contact frequency with political organizations, by income

Organization	Frequency	Income (yuan)		<1000		1000-1999		2000-2999		3000-3999		4000-4999		5000-5999		6000-6999		>7000	
		abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Social housing office of Guangzhou	never	23	34.8	34	31.5	30	31.6	34	33.7	33	36.7	27	38.0	17	30.9	33	44.6		
	rarely	23	34.8	47	43.5	41	43.2	38	37.6	37	41.1	30	42.3	28	50.9	25	33.8		
	normal	11	16.7	16	14.8	12	12.6	22	21.8	15	16.7	8	11.3	7	12.7	15	20.3		
	often	4	6.1	7	6.5	7	7.4	3	3.0	4	4.4	2	2.8	2	3.6	1	1.4		
	very often	5	7.6	4	3.7	5	5.3	4	4.0	1	1.1	4	5.6	1	1.8	0	0.0		
Guangzhou municipal civil affairs bureau	never	20	30.3	45	41.7	38	40.0	35	34.7	30	33.3	35	49.3	24	43.6	38	51.4		
	rarely	21	31.8	33	30.6	37	38.9	47	46.5	42	46.7	27	38.0	26	47.3	27	36.5		
	normal	11	16.7	21	19.4	14	14.7	11	10.9	15	16.7	7	9.9	3	5.5	9	12.2		
	often	9	13.6	7	6.5	3	3.2	4	4.0	2	2.2	1	1.4	1	1.8	0	0.0		
	very often	5	7.6	2	1.9	3	3.2	4	4.0	1	1.1	1	1.4	1	1.8	0	0.0		
District street office	never	11	16.7	25	23.1	16	16.8	21	20.8	21	23.3	18	25.4	15	27.3	16	21.6		
	rarely	11	16.7	28	25.9	40	42.1	36	35.6	32	35.6	33	46.5	19	34.5	30	40.5		
	normal	23	34.8	39	36.1	24	25.3	32	31.7	30	33.3	16	22.5	18	32.7	26	35.1		
	often	16	24.2	9	8.3	13	13.7	8	7.9	5	5.6	2	2.8	3	5.5	2	2.7		
	very often	5	7.6	7	6.5	2	2.1	4	4.0	2	2.2	2	2.8	0	0.0	0	0.0		
District neighbourhood committee	never	5	7.6	23	21.3	15	15.8	16	15.8	10	11.1	16	22.5	9	16.4	10	13.5		
	rarely	13	19.7	21	19.4	32	33.7	33	32.7	31	34.4	27	38.0	16	29.1	30	40.5		
	normal	22	33.3	38	35.2	29	30.5	28	27.7	35	38.9	20	28.2	25	45.5	28	37.8		
	often	19	28.8	22	20.4	16	16.8	21	20.8	12	13.3	8	11.3	4	7.3	5	6.8		
	very often	7	10.6	4	3.7	3	3.2	3	3.0	2	2.2	0	0.0	1	1.8	1	1.4		
Property company	never	8	12.1	17	15.7	14	14.7	9	8.9	12	13.3	16	22.5	8	14.5	7	9.5		
	rarely	18	27.3	29	26.9	29	30.5	27	26.7	27	30.0	18	25.4	15	27.3	23	31.1		
	normal	21	31.8	39	36.1	34	35.8	32	31.7	27	30.0	22	31.0	23	41.8	33	44.6		
	often	14	21.2	20	18.5	16	16.8	29	28.7	21	23.3	12	16.9	8	14.5	10	13.5		
	very often	5	7.6	3	2.8	2	2.1	4	4.0	3	3.3	3	4.2	1	1.8	1	1.4		
Local police station	never	35	53.0	62	57.4	45	47.4	49	48.5	41	45.6	41	57.7	26	47.3	36	48.6		
	rarely	18	27.3	32	29.6	36	37.9	33	32.7	33	36.7	27	38.0	22	40.0	27	36.5		
	normal	9	13.6	11	10.2	11	11.6	16	15.8	11	12.2	3	4.2	7	12.7	10	13.5		
	often	1	1.5	3	2.8	2	2.1	2	2.0	3	3.3	0	0.0	0	0.0	1	1.4		
	very often	3	4.5	0	0.0	1	1.1	1	1.0	2	2.2	0	0.0	0	0.0	0	0.0		
District volunteers' organization	never	24	36.4	53	49.1	42	44.2	39	38.6	32	35.6	41	57.7	26	47.3	29	39.2		
	rarely	19	28.8	29	26.9	36	37.9	34	33.7	33	36.7	26	36.6	21	38.2	32	43.2		
	normal	15	22.7	21	19.4	9	9.5	18	17.8	16	17.8	2	2.8	7	12.7	9	12.2		
	often	3	4.5	5	4.6	7	7.4	6	5.9	5	5.6	1	1.4	0	0.0	4	5.4		
	very often	5	7.6	0	0.0	1	1.1	4	4.0	4	4.4	1	1.4	1	1.8	0	0.0		
District owner (Eigentümer) committee	never	36	54.5	63	58.3	53	55.8	42	41.6	42	46.7	40	56.3	27	49.1	39	52.7		
	rarely	13	19.7	27	25.0	29	30.5	32	31.7	30	33.3	22	31.0	22	40.0	22	29.7		
	normal	13	19.7	12	11.1	9	9.5	21	20.8	15	16.7	7	9.9	5	9.1	11	14.9		
	often	2	3.0	5	4.6	4	4.2	5	5.0	2	2.2	2	2.8	1	1.8	2	2.7		
	very often	2	3.0	1	0.9	0	0.0	1	1.0	1	1.1	0	0.0	0	0.0	0	0.0		
Media	never	40	60.6	83	76.9	67	70.5	69	68.3	53	58.9	57	80.3	33	60.0	52	70.3		
	rarely	15	22.7	17	15.7	22	23.2	24	23.8	31	34.4	12	16.9	18	32.7	17	23.0		
	normal	5	7.6	4	3.7	4	4.2	6	5.9	4	4.4	2	2.8	4	7.3	5	6.8		
	often	2	3.0	2	1.9	1	1.1	1	1.0	1	1.1	0	0.0	0	0.0	0	0.0		
	very often	4	6.1	2	1.9	1	1.1	1	1.0	1	1.1	0	0.0	0	0.0	0	0.0		
<b>Subtotal</b>		<b>66</b>	<b>100.0</b>	<b>108</b>	<b>100.0</b>	<b>95</b>	<b>100.0</b>	<b>101</b>	<b>100.0</b>	<b>90</b>	<b>100.0</b>	<b>71</b>	<b>100.0</b>	<b>55</b>	<b>100.0</b>	<b>74</b>	<b>100.0</b>		

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities of Guangzhou (n=660), Question E1-E9 (see in Appendices A.2). Surveyed by Chao, R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Political participation by the type of family.** Based on the family income level and social status, the registered residents in social housing communities may be categorized into several types. The local government has classified them as the low-income family, low insurance household, the poor household, special family (widowed, elderly, disabled, veterans' relatives etc.), common family and other. The first three types are economically weak families with limited income. The low-income family group and the poor household are defined in terms of their monthly income. The top income of the poor household is on a lower level than that of the low-income family. While the examination of the

Tab. 11.11 Surveyed social housing residents' contact frequency with political organizations, by type of family

Organization	Frequency	Family		Low-income family		Low insurance household		Poor household		Special family <sup>a</sup>		Common family		Other	
		abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Social housing office of Guangzhou	never	61	41.5	16	24.2	2	33.3	8	32.0	140	34.8	4	28.6		
	rarely	54	36.7	24	36.4	3	50.0	8	32.0	173	43.0	7	50.0		
	normal	16	10.9	14	21.2	1	16.7	4	16.0	69	17.2	2	14.3		
	often	6	4.1	5	7.6	0	0.0	5	20.0	13	3.2	1	7.1		
	very often	10	6.8	7	10.6	0	0.0	0	0.0	7	1.7	0	0.0		
Guangzhou municipal civil affairs bureau	never	71	48.3	17	25.8	2	33.3	9	36.0	161	40.0	5	35.7		
	rarely	45	30.6	23	34.8	2	33.3	8	32.0	176	43.8	6	42.9		
	normal	20	13.6	13	19.7	0	0.0	7	28.0	49	12.2	2	14.3		
	often	6	4.1	7	10.6	2	33.3	1	4.0	10	2.5	1	7.1		
	very often	5	3.4	6	9.1	0	0.0	0	0.0	6	1.5	0	0.0		
District street office	never	39	26.5	8	12.1	1	16.7	3	12.0	90	22.4	2	14.3		
	rarely	42	28.6	17	25.8	3	50.0	8	32.0	154	38.3	5	35.7		
	normal	45	30.6	25	37.9	0	0.0	8	32.0	124	30.8	6	42.9		
	often	17	11.6	8	12.1	2	33.3	4	16.0	26	6.5	1	7.1		
	very often	4	2.7	8	12.1	0	0.0	2	8.0	8	2.0	0	0.0		
District neighbourhood committee	never	34	23.1	5	7.6	0	0.0	2	8.0	63	15.7	0	0.0		
	rarely	30	20.4	15	22.7	3	50.0	6	24.0	146	36.3	3	21.4		
	normal	49	33.3	20	30.3	0	0.0	9	36.0	140	34.8	7	50.0		
	often	28	19.0	20	30.3	3	50.0	7	28.0	45	11.2	4	28.6		
	very often	6	4.1	6	9.1	0	0.0	1	4.0	8	2.0	0	0.0		
Property company	never	27	18.4	6	9.1	0	0.0	4	16.0	53	13.2	1	7.1		
	rarely	40	27.2	18	27.3	2	33.3	10	40.0	115	28.6	1	7.1		
	normal	51	34.7	20	30.3	1	16.7	6	24.0	148	36.8	5	35.7		
	often	24	16.3	16	24.2	2	33.3	5	20.0	77	19.2	6	42.9		
	very often	5	3.4	6	9.1	1	16.7	0	0.0	9	2.2	1	7.1		
Local police station	never	90	61.2	35	53.0	2	33.3	15	60.0	187	46.5	6	42.9		
	rarely	37	25.2	19	28.8	4	66.7	8	32.0	156	38.8	4	28.6		
	normal	16	10.9	8	12.1	0	0.0	1	4.0	50	12.4	3	21.4		
	often	1	0.7	2	3.0	0	0.0	1	4.0	7	1.7	1	7.1		
	very often	3	2.0	2	3.0	0	0.0	0	0.0	2	0.5	0	0.0		
District volunteers' organization	never	73	49.7	26	39.4	1	16.7	15	60.0	164	40.8	7	50.0		
	rarely	37	25.2	23	34.8	4	66.7	3	12.0	162	40.3	1	7.1		
	normal	27	18.4	12	18.2	0	0.0	4	16.0	53	13.2	1	7.1		
	often	5	3.4	3	4.5	0	0.0	3	12.0	15	3.7	5	35.7		
	very often	5	3.4	2	3.0	1	16.7	0	0.0	8	2.0	0	0.0		
District owner (Eigentümer) committee	never	89	60.5	36	54.5	2	33.3	18	72.0	192	47.8	5	35.7		
	rarely	36	24.5	15	22.7	4	66.7	4	16.0	134	33.3	4	28.6		
	normal	16	10.9	10	15.2	0	0.0	2	8.0	61	15.2	4	28.6		
	often	4	2.7	4	6.1	0	0.0	1	4.0	13	3.2	1	7.1		
	very often	2	1.4	1	1.5	0	0.0	0	0.0	2	0.5	0	0.0		
Media	never	111	75.5	47	71.2	2	33.3	21	84.0	265	65.9	8	57.1		
	rarely	22	15.0	10	15.2	4	66.7	3	12.0	112	27.9	5	35.7		
	normal	8	5.4	4	6.1	0	0.0	0	0.0	21	5.2	1	7.1		
	often	1	0.7	3	4.5	0	0.0	1	4.0	2	0.5	0	0.0		
	very often	5	3.4	2	3.0	0	0.0	0	0.0	2	0.5	0	0.0		
<b>Subtotal</b>		<b>147</b>	<b>100.0</b>	<b>66</b>	<b>100.0</b>	<b>6</b>	<b>100.0</b>	<b>25</b>	<b>100.0</b>	<b>402</b>	<b>100.0</b>	<b>14</b>	<b>100.0</b>		

Note: <sup>a</sup> Special family refers to the household may get financial assistance or in-kind subsidies (e.g. housing) from the government in reason of special reasons, such as widowed, elderly, disabled, veterans' relatives etc. families.

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities of Guangzhou (n=660), Question E1-E9 (see in Appendices A.2). Surveyed by Chao, R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

low insurance household also depends on some additional conditions regarding socially weak members like being disabled or divorced. The standards of these groups are adjusting regularly based on the average income level of local citizens. Generally, first four types may get financial subsidies or in-kind subsidies from local government. By analysing the results of every group that responded regarding their contact with organizations, we find there is a gap between the



first four groups and the common family in terms of participation in administrative agencies (i.e. the Guangzhou social housing office, the Guangzhou municipal civil affairs bureau, the district street office and the district neighbourhood committee). Compared to the common family, subsidized families demonstrate more connections with these organizations as indicated by their higher percentages on the answers 'often' and 'very often' and lower levels on answers 'never' and 'rarely'. However, the gap almost disappears in results relating to the other five groups, where all groups display at an equal level and no clear differences exist among them. To conclude, the status of the family would appear only to influence the outcome of surveyed people in regard to contact with administrative organizations. As we know, the first four types are authorized by local administrative agencies through a formal application process. This connection may be the reason for the higher contact frequencies of the four groups than the common family. Nevertheless, the defined family status in the administration system seems not to affect residents' behaviour in participating in the activities of other organizations.

#### 11.1.1.2 Sociocultural participation

With the aim of finding out how often residents of social housing communities participate in sociocultural activities, our survey designed eight activities (see Tab.11.12) and asked the respondents to judge their own situations by indicating the most applicable answer on a five-point scale. In terms of the participative frequency, the five categories are "never", "seldom", "sometimes", "very often" and "every time". The survey questions about sociocultural activities included elections, entertainment, cultural exchange, sports and some spontaneous neighbourhood activities. Two political elections may be related to residents living in social housing, one is for the community neighbourhood committee, and the other is the community owner committee. Cultural activities refer to organized studies or communication at community cultural centres for training skills or pursuing interests. Recreational activities refer to singing, dancing etc. things done in their free time, neighbours may participate in the same hobbies. Activities related to volunteering and donations are normally launched spontaneously within the community. With respect to daily leisure activities, our survey defined these as the morning exercises, fitness and such sports that happen in public areas in the community. In addition, the discussions regarding issues of residence are also taken into consideration. These sociocultural activities are mostly locally induced and largely depend on the decisions and management of community-based organizers (public services, public power, elected leaders etc.).

As shown in Tab.11.12, a total of 660 social housing residents responded our survey. An overview of percentages of the five categories by frequency of activities indicates that the majority of respondents in social housing communities never or rarely join in these activities. Apart from outdoor leisure activities, more than 70% of people responded "never" and "seldom" to the other seven activities. No big differences are displayed in participating frequency in these activities. A vertical comparison shows that the percentages of categories for other seven activity categories are comparable. For example, around 70% of respondents gave to negative responses "never" and "seldom", approximately 20% of people selected "some time", and just over 10% chose very positive answers "very often" and "every time". However, the surveyed residents present distinctly high participation in outdoor leisure activities, with only 15.9% in the category "never", 19.2% in the category "seldom", 23.5% in "very often" and 13.5% in the "every time". This result reveals that the most participated in sociocultural activity of social housing residents seems to be outdoor exercise. The representation of people in this activity demonstrates far higher participation than in any other sociocultural activities.

The next step is to discover what factors may affect people's participation in sociocultural activities. By using the same approach as in political participation, we have selected some factors and cross tabulated them (e.g. location, construction time of the community; personal information like age, gender, education ) with the participating behaviour (i.e. never, seldom, some time, very often, every time). In terms of the results shown in Tab.11.13 – Tab.11.21, this study elaborates on the tabulated data and attempts to identify what effects the factors may have.

**Tab. 11.12 Overview of surveyed social housing residents' participation in sociocultural activities**

Activities	Frequency		Never		Seldom		Some time		Very often		Every time		Total	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Election of the community neighbourhood committee	312	47.3	134	20.3	131	19.8	37	5.6	46	7.0	660	100.0		
Election of the community owner committee	351	53.2	158	23.9	95	14.4	33	5.0	23	3.5	660	100.0		
Cultural activities of the community centre (studies of interest or skills etc.)	261	39.5	168	25.5	177	26.8	37	5.6	17	2.6	660	100.0		
Recreational activities of the community centre (singing, dancing etc.)	230	34.8	195	29.5	156	23.6	53	8.0	26	3.9	660	100.0		
Community volunteering activities (helping others)	296	44.8	193	29.2	125	18.9	29	4.4	17	2.6	660	100.0		
Spontaneous community donation activities	273	41.4	196	29.7	148	22.4	29	4.4	14	2.1	660	100.0		
Outdoor leisure activities (morning exercises, fitness etc.)	105	15.9	127	19.2	184	27.9	155	23.5	89	13.5	660	100.0		
Discussions on community building issues online or in meetings	304	46.1	173	26.2	104	15.8	64	9.7	15	2.3	660	100.0		

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question E10-E17 (see in Appendices A.2). Surveyed by Chao, R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Sociocultural participation by living location.** As we can see from Tab.11.13, the 13 surveyed communities have been regrouped into four clusters. Fanghe, Guocun and Dang'en lie in Liwan district and are classified as the western cluster; the middle cluster has only one community, Jude; the eastern cluster has 160 respondents from four communities, Tangde, Guangdan, Anxia and Tai'an; and the northern cluster includes the other five communities, Zede, Jinshazhou, Jide, Huize Yaxuan and Likang.

In comparing the results of four groups, a notable gap is found between the western cluster and the other three clusters. Surveyed people living in these four clusters have distinct differences in terms of participating in sociocultural activities. The social housing respondents situated in the western cluster demonstrate greater participation frequencies than those living in the other three areas. Although this overwhelming predominance decreases to some extent in outdoor leisure activities, it clearly exists for most sociocultural activities. To take the first activity as an example, only 24.4% and 10.4% of surveyed people in the western group indicated "never" and "seldom". However, these two answers are respectively high compared to 54.3% and 10.0%, 30.0% and 42.0%, 56.9% and 14.4% in the middle cluster, eastern cluster and northern cluster. At the same time, 27.0% of participants in the western cluster very often join in the election of the community neighbourhood committee and 34.8% of them attend every time. The percentages of these two categories drop to 7.1% and 11.4% in the middle cluster, 2.0% and 2.0% in the eastern cluster, and 5.0% and 3.8% in the northern cluster. The results for the rest of the cultural, recreational or spontaneous activities (except the outdoor leisure) are similar. The situation thus indicate that social housing communities that lie in the western cluster may have residents with much higher involvement in sociocultural activities.

In addition to the above findings, another three clusters also demonstrate some differences. The middle cluster and the northern cluster display a comparable level, while the middle cluster is slightly higher than the latter cluster. However, the eastern cluster displays a clear-cut lower level. For instance, the percentages of the categories "very often" and "every time" for the election of the community owner committee are respectively 6.4% and 4.3% (middle cluster), 5.6% and 4.4% (northern cluster), 2.0% and 1.0% (eastern cluster) from high to low. To conclude, the location of social housing communities may be significantly linked to the residents' participation in sociocultural activities. Residents of the western cluster indicate a much higher degree of participation than any other surveyed residents. At the same time, residents in the eastern cluster appear to be less involved in these activities apart from outdoor leisure activities.

Tab. 11.13 The participation into sociocultural activities of surveyed social housing residents, by locations

Activities	Frequency	Location	Western cluster		Middle cluster		Eastern cluster		Northern cluster	
			abs.	%	abs.	%	abs.	%	abs.	%
Election of the community neighbourhood committee	never		76	24.4	76	54.3	30	30.0	91	56.9
	seldom		14	10.4	14	10.0	42	42.0	23	14.4
	sometimes		24	18.3	24	17.1	24	24.0	32	20.0
	very often		10	27.0	10	7.1	2	2.0	8	5.0
	every time		16	34.8	16	11.4	2	2.0	6	3.8
Election of the community owner committee	never		90	25.6	90	64.3	34	34.0	87	54.4
	seldom		15	9.5	15	10.7	42	42.0	31	19.4
	sometimes		20	21.1	20	14.3	21	21.0	26	16.3
	very often		9	27.3	9	6.4	2	2.0	9	5.6
	every time		6	26.1	6	4.3	1	1.0	7	4.4
Cultural activities of the community centre (studies of interest or skills etc.)	never		54	20.7	54	38.6	31	31.0	70	43.8
	seldom		23	13.7	23	16.4	38	38.0	40	25.0
	sometimes		40	22.6	40	28.6	28	28.0	41	25.6
	very often		13	35.1	13	9.3	3	3.0	7	4.4
	every time		10	58.8	10	7.1	0	0.0	2	1.3
Recreational activities of the community centre (singing, dancing etc.)	never		52	22.6	52	37.1	28	28.0	51	31.9
	seldom		27	13.8	27	19.3	41	41.0	52	32.5
	sometimes		30	19.2	30	21.4	28	28.0	39	24.4
	very often		19	35.8	19	13.6	3	3.0	13	8.1
	every time		12	46.2	12	8.6	0	0.0	5	3.1
Community volunteering activities (helping others)	never		67	22.6	67	47.9	34	34.0	77	48.1
	seldom		28	14.5	28	20.0	56	56.0	37	23.1
	sometimes		26	20.8	26	18.6	10	10.0	37	23.1
	very often		10	34.5	10	7.1	0	0.0	7	4.4
	every time		9	52.9	9	6.4	0	0.0	2	1.3
Spontaneous community donation activities	never		63	23.1	63	45.0	30	30.0	73	45.6
	seldom		29	14.8	29	20.7	51	51.0	40	25.0
	sometimes		35	23.6	35	25.0	18	18.0	36	22.5
	very often		9	31.0	9	6.4	1	1.0	8	5.0
	every time		4	28.6	4	2.9	0	0.0	3	1.9
Outdoor leisure activities (morning exercises, fitness etc.)	never		24	22.9	24	17.1	8	8.0	34	21.3
	seldom		17	13.4	17	12.1	30	30.0	37	23.1
	sometimes		31	16.8	31	22.1	47	47.0	43	26.9
	very often		34	21.9	34	24.3	10	10.0	36	22.5
	every time		34	38.2	34	24.3	5	5.0	10	6.3
Discussions on community building issues online or in meetings	never		63	20.7	63	45.0	40	40.0	79	49.4
	seldom		28	16.2	28	20.0	48	48.0	32	20.0
	sometimes		27	26.0	27	19.3	10	10.0	30	18.8
	very often		18	28.1	18	12.9	2	2.0	16	10.0
	every time		4	26.7	4	2.9	0	0.0	3	1.9
<b>Subtotal</b>			<b>140</b>	<b>100.0</b>	<b>100</b>	<b>100.0</b>	<b>160</b>	<b>100.0</b>	<b>260</b>	<b>100.0</b>

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question E10-E17 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Sociocultural participation by the construction time of the community.** As introduced in Chapter 4, social housing construction in Guangzhou took place in two stages. In 1998, a large amount of ANJU and JIEKUN housing (the early type of the economically affordable housing) was provided to local citizens with low levels of income. The new wave in social housing that followed comprised LRH and EAH. The study classified the 13 targeted communities into three groups according to the time the housing was developed: “1998”, “2008-2010” and “after 2010” (see in Tab.11.14). At the time of the survey, 2013, housing in the majority of the communities developed after 2010 had not been completed for residence. People in completed new neighbourhoods (e.g. Guangdan, Anxia and Huize Yaxuan) therefore had only short residential experiences by that time.

**Tab. 11.14 Surveyed social housing residents' participation in sociocultural activities by construction time**

Activities	Frequency	Construct time	1998		2008-2010		After 2010	
			abs.	%	abs.	%	abs.	%
Election of the community neighbourhood committee	never		144	45.1	124	44.1	44	73.3
	seldom		74	23.2	51	18.1	9	15.0
	sometimes		69	21.6	57	20.3	5	8.3
	very often		15	4.7	20	7.1	2	3.3
	every time		17	5.3	29	10.3	0	0.0
Election of the community owner committee	never		156	48.9	149	53.0	46	76.7
	seldom		94	29.5	57	20.3	7	11.7
	sometimes		44	13.8	44	15.7	7	11.7
	very often		15	4.7	18	6.4	0	0.0
	every time		10	3.1	13	4.6	0	0.0
Cultural activities of the community centre (studies of interest or skills etc.)	never		134	42.0	88	31.3	39	65.0
	seldom		87	27.3	71	25.3	10	16.7
	sometimes		84	26.3	84	29.9	9	15.0
	very often		12	3.8	24	8.5	1	1.7
	every time		2	0.6	14	5.0	1	1.7
Recreational activities of the community centre (singing, dancing etc.)	never		115	36.1	86	30.6	29	48.3
	seldom		100	31.3	78	27.8	17	28.3
	sometimes		74	23.2	70	24.9	12	20.0
	very often		22	6.9	30	10.7	1	1.7
	every time		8	2.5	17	6.0	1	1.7
Community volunteering activities (helping others)	never		142	44.5	111	39.5	43	71.7
	seldom		106	33.2	79	28.1	8	13.3
	sometimes		56	17.6	61	21.7	8	13.3
	very often		13	4.1	16	5.7	0	0.0
	every time		2	0.6	14	5.0	1	1.7
Spontaneous community donation activities	never		129	40.4	103	36.7	41	68.3
	seldom		107	33.5	77	27.4	12	20.0
	sometimes		65	20.4	77	27.4	6	10.0
	very often		14	4.4	15	5.3	0	0.0
	every time		4	1.3	9	3.2	1	1.7
Outdoor leisure activities (morning exercises, fitness etc.)	never		45	14.1	40	14.2	20	33.3
	seldom		66	20.7	46	16.4	15	25.0
	sometimes		105	32.9	67	23.8	12	20.0
	very often		70	21.9	77	27.4	8	13.3
	every time		33	10.3	51	18.1	5	8.3
Discussions on community building issues online or in meetings	never		142	44.5	125	44.5	37	61.7
	seldom		94	29.5	68	24.2	11	18.3
	sometimes		44	13.8	51	18.1	9	15.0
	very often		32	10.0	29	10.3	3	5.0
	every time		7	2.2	8	2.8	0	0.0
<b>Subtotal</b>			<b>319</b>	<b>100.0</b>	<b>281</b>	<b>100.0</b>	<b>60</b>	<b>100.0</b>

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n =660), Question E10-E17 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

Based on their situation, respondents were required to judge their participative behaviour and to select the most fitting answer from the five-scale (i.e. never, seldom, sometimes, very often and every time). From the percentages on the five-scale, an apparent difference is visible between the first two groups (i.e. 1998 and 2008-2010) and the last group (i.e. after 2010). People from communities built after 2010 responded in a distinctly high numbers with “never”, and very low proportions of the categories “very often” and “every time”. 73.3% people never join in the election of the community neighbourhood committee, and 76.7% of them never attend the election of the community owner committee. However, only 45.1% and 44.1% of surveyed people of the first two groups never join in the former election, and respectively 48.9% and 53.0% of them never attend the latter. At the same time, only 3.3% and 0.0% of people in the group “after 2010” selected “very often”, which is a lot lower than the results of group “1998” (4.7% and 5.3%) and those of the

“2008-2010” group (7.1% and 10.3%). This difference is displayed in every sociocultural activity. These findings strongly manifest the low degree of sociocultural participation by people from communities built after 2010.

Moreover, no big differences exist between the other two groups “1998” and “2008-2010”. In term of the percentages of the two groups, the surveyed people in communities built 2008-2010, mostly have slightly higher rates, to some extent, on the categories “sometimes” “very often” and “every time”. We can see that people in newly developed communities after 2010 attend fewer local sociocultural activities. In addition, the comparable results of “2008-2010” and “1998”, and even better situation of “2008-2010”, may reveal the degree of participation would improve with dwelling length.

**Sociocultural participation by the scale of community.** Drawing on the results in Tab.11.15. Firstly, we find the “small scale” has a special difference to the “big scale” and “medium scale”. Respondents from small-size communities replied with distinctly high percentages on the category “never” on participating in all listed activities. However, the percentages of the category “seldom” shrink to a very low level that largely falls below the other two groups’. The total percentage of two categories does not show big gaps by three groups. To take the proportions of three groups as an instance, the first election has successively 47.3%, 42.1%, 59.4% on “never”, and 17.2%, 27.9%, 11.9% on “seldom”. Therefore, this may imply that a higher percentage of residents in small-size social housing communities never get involved into sociocultural activities, but the degree of positive participation by people in small-size communities does not seem to reduce or fall.

Regarding the two elections, no clear distinction appears among the three groups. This may indicate the scale of community does not cause big differences in residents’ participation in local election activities. We then turn to the results of cultural, recreational, volunteering and donative activities. A common phenomenon exists. As the scale of the community increases, the percentages of the categories, “sometimes”, “very often” and “every time”, slowly increase. This proves that the size of the community may be positively related to sociocultural participation; that is, people living in larger communities may have higher possibility of being involved in or attached to these activities than those in smaller communities to some extent. Because no big difference exists between the group “big scale” and the “medium scale”, it indicates that the size may stimulate residents’ behaviour, and this slightly positive effect may weaken to some extent when the size increases over a certain level. According to the classified standard, large-scale communities contain over 4000 people, medium-scale communities have 1500-3000 people, and small-scale communities normally have a population below 1500 people. Therefore, social housing communities built on either a medium or a large scale may have greatly increased levels of cultural, recreational and volunteering participation by residents. Nevertheless, in participating in outdoor leisure activities and spontaneous discussions, the advantage of the large size disappears. Varying results appear between the three groups: people in both small-scale and large-scale communities present an equally high participative level, but residents from medium-scale communities responded with lower participation frequencies.

**Tab. 11.15 Surveyed social housing residents' participation in sociocultural activities by the scale of the community**

Activities	Frequency	Scale	Big scale (>4000 person)		Medium scale (1500-3000 person)		Small scale (<1500 person)	
			abs.	%	abs.	%	abs.	%
Election of the community neighbourhood committee	never		151	47.3	101	42.1	60	59.4
	seldom		55	17.2	67	27.9	12	11.9
	sometimes		57	17.9	54	22.5	20	19.8
	very often		23	7.2	10	4.2	4	4.0
	every time		33	10.3	8	3.3	5	5.0
Election of the community owner committee	never		181	56.7	103	42.9	67	66.3
	seldom		67	21.0	80	33.3	11	10.9
	sometimes		39	12.2	39	16.3	17	16.8
	very often		19	6.0	10	4.2	4	4.0
	every time		13	4.1	8	3.3	2	2.0
Cultural activities of the community centre (studies of interest or skills etc.)	never		119	37.3	93	38.8	49	48.5
	seldom		73	22.9	71	29.6	24	23.8
	sometimes		94	29.5	67	27.9	16	15.8
	very often		19	6.0	7	2.9	11	10.9
	every time		14	4.4	2	0.8	1	1.0
Recreational activities of the community centre (singing, dancing etc.)	never		112	35.1	72	30.0	46	45.5
	seldom		85	26.6	85	35.4	25	24.8
	sometimes		72	22.6	66	27.5	18	17.8
	very often		31	9.7	12	5.0	10	9.9
	every time		19	6.0	5	2.1	2	2.0
Community volunteering activities (helping others)	never		138	43.3	99	41.3	59	58.4
	seldom		75	23.5	94	39.2	24	23.8
	sometimes		75	23.5	39	16.3	11	10.9
	very often		17	5.3	6	2.5	6	5.9
	every time		14	4.4	2	0.8	1	1.0
Spontaneous community donation activities	never		130	40.8	86	35.8	57	56.4
	seldom		80	25.1	93	38.8	23	22.8
	sometimes		81	25.4	50	20.8	17	16.8
	very often		18	5.6	9	3.8	2	2.0
	every time		10	3.1	2	0.8	2	2.0
Outdoor leisure activities (morning exercises, fitness etc.)	never		42	13.2	37	15.4	26	25.7
	seldom		51	16.0	65	27.1	11	10.9
	sometimes		80	25.1	86	35.8	18	17.8
	very often		84	26.3	40	16.7	31	30.7
	every time		62	19.4	12	5.0	15	14.9
Discussions on community building issues online or in meetings	never		137	42.9	111	46.3	56	55.4
	seldom		77	24.1	81	33.8	15	14.9
	sometimes		60	18.8	32	13.3	12	11.9
	very often		37	11.6	13	5.4	14	13.9
	every time		8	2.5	3	1.3	4	4.0
<b>Subtotal</b>			<b>319</b>	<b>100.0</b>	<b>240</b>	<b>100.0</b>	<b>101</b>	<b>100.0</b>

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question E10-E17 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Sociocultural participation by mixed type of community.** As indicated in Tab.11.16, 13 communities were reclassified into three groups in terms of the mixed type of social housing. Fully mixed communities contain all kinds of social housing developed during each period. Half-mixed communities have two types, LRH and EAH. In addition, single communities refer to those that only provide EAH. Firstly, we can see the group "single" always presents a much higher percentage on the category "never". To glance at eight activities indicates that this percentage of the group "single" exceeds the results of another two groups by at least 10%. In contrast, the proportion in the category "seldom" decreases to a lower level. This situation may imply that a larger number of people in "single" communities do not care about local sociocultural activities, but this does not seem to really influence the participation of the other residents. Regarding the positive involvement, no clear differences exist among the three groups. However, the surveyed people in half-mixed communities demonstrate a comparable high activity. More people chose the category "sometimes", and

the percentages of “very often” and “every time” stay at a slightly higher level. In addition, the participation of people in fully mixed communities presents a slight participation compared to the situation in “single” communities. To conclude these results, a mixed type of community may have a weak and positive effect on residents’ sociocultural participation.

**Tab. 11.16 Surveyed social housing residents’ participation in sociocultural activities, by mixed type housing**

Activities	Frequency	Mixed type		Fully mixed <sup>a</sup>		Half-mixed <sup>b</sup>		Single <sup>c</sup>	
				abs.	%	abs.	%	abs.	%
Election of the community neighbourhood committee	never			144	45.1	121	46.5	47	58.0
	seldom			74	23.2	48	18.5	12	14.8
	sometimes			69	21.6	48	18.5	14	17.3
	very often			15	4.7	18	6.9	4	4.9
	every time			17	5.3	25	9.6	4	4.9
Election of the community owner committee	never			156	48.9	143	55.0	52	64.2
	seldom			94	29.5	53	20.4	11	13.6
	sometimes			44	13.8	37	14.2	14	17.3
	very often			15	4.7	16	6.2	2	2.5
	every time			10	3.1	11	4.2	2	2.5
Cultural activities of the community centre (studies of interest or skills etc.)	never			134	42.0	84	32.3	43	53.1
	seldom			87	27.3	68	26.2	13	16.0
	sometimes			84	26.3	78	30.0	15	18.5
	very often			12	3.8	17	6.5	8	9.9
	every time			2	0.6	13	5.0	2	2.5
Recreational activities of the community centre (singing, dancing etc.)	never			115	36.1	81	31.2	34	42.0
	seldom			100	31.3	74	28.5	21	25.9
	sometimes			74	23.2	64	24.6	18	22.2
	very often			22	6.9	26	10.0	5	6.2
	every time			8	2.5	15	5.8	3	3.7
Community volunteering activities (helping others)	never			142	44.5	108	41.5	46	56.8
	seldom			106	33.2	68	26.2	19	23.5
	sometimes			56	17.6	59	22.7	10	12.3
	very often			13	4.1	12	4.6	4	4.9
	every time			2	0.6	13	5.0	2	2.5
Spontaneous community donation activities	never			129	40.4	103	39.6	41	50.6
	seldom			107	33.5	68	26.2	21	25.9
	sometimes			65	20.4	68	26.2	15	18.5
	very often			14	4.4	13	5.0	2	2.5
	every time			4	1.3	8	3.1	2	2.5
Outdoor leisure activities (morning exercises, fitness etc.)	never			45	14.1	38	14.6	22	27.2
	seldom			66	20.7	43	16.5	18	22.2
	sometimes			105	32.9	68	26.2	11	13.6
	very often			70	21.9	68	26.2	17	21.0
	every time			33	10.3	43	16.5	13	16.0
Discussions on community building issues online or in meetings	never			142	44.5	114	43.8	48	59.3
	seldom			94	29.5	62	23.8	17	21.0
	sometimes			44	13.8	52	20.0	8	9.9
	very often			32	10.0	27	10.4	5	6.2
	every time			7	2.2	5	1.9	3	3.7
<b>Subtotal</b>				<b>319</b>	<b>100.0</b>	<b>260</b>	<b>100.0</b>	<b>81</b>	<b>100.0</b>

Note: <sup>a</sup> Fully mixed community refers to the older neighbourhoods that contain all kinds of social housing (includes low-rent housing, affordable housing, ANJU housing and JIEkun housing) built from 1998, residents in different housing types may live next door to each other. <sup>b</sup> Half-mixed community means neighbourhoods built after 2008, which only have two types of housing: low-rent housing and affordable housing. Two types of housing are built in different large buildings and are spatially independent of each other. <sup>c</sup> Single community refers to neighbourhoods with only affordable housing.

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question E10-E17 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.



**Sociocultural participation by the age.** According to the age of surveyed residents, we classified them into six groups by every ten years (see Tab.11.17). Because only one person under 20 years old was surveyed and that person never participated in any sociocultural activities, this study leaves out this case in the following analysis and only considers five age groups, “20-29”, “30-39”, “40-49”, “50-59” and “>=60”.

**Tab. 11.17** Surveyed social housing residents’ participation in sociocultural activities, by age

Activities	Frequency	Age	<20		20-29		30-39		40-49		50-59		≥60	
			abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Election of the community neighbourhood committee	never		1	100.0	27	48.2	40	41.7	51	46.8	127	49.0	61	48.8
	seldom		0	0.0	13	23.2	30	31.3	22	20.2	43	16.6	23	18.4
	sometimes		0	0.0	13	23.2	18	18.8	25	22.9	50	19.3	22	17.6
	very often		0	0.0	2	3.6	4	4.2	5	4.6	18	6.9	6	4.8
	every time		0	0.0	1	1.8	4	4.2	6	5.5	21	8.1	13	10.4
Election of the community owner committee	never		1	100.0	26	46.4	43	44.8	56	51.4	147	56.8	72	57.6
	seldom		0	0.0	21	37.5	27	28.1	35	32.1	44	17.0	26	20.8
	sometimes		0	0.0	8	14.3	16	16.7	14	12.8	38	14.7	17	13.6
	very often		0	0.0	1	1.8	6	6.3	3	2.8	19	7.3	4	3.2
	every time		0	0.0	0	0.0	4	4.2	1	0.9	11	4.2	6	4.8
Cultural activities of the community centre (studies of interest or skills etc.)	never		0	0.0	16	28.6	33	34.4	43	39.4	112	43.2	55	44.0
	seldom		1	100.0	15	26.8	34	35.4	30	27.5	50	19.3	33	26.4
	sometimes		0	0.0	20	35.7	25	26.0	32	29.4	70	27.0	24	19.2
	very often		0	0.0	4	7.1	4	4.2	4	3.7	16	6.2	9	7.2
	every time		0	0.0	1	1.8	0	0.0	0	0.0	11	4.2	4	3.2
Recreational activities of the community centre (singing, dancing etc.)	never		1	100.0	15	26.8	31	32.3	40	36.7	92	35.5	49	39.2
	seldom		0	0.0	21	37.5	39	40.6	30	27.5	69	26.6	29	23.2
	sometimes		0	0.0	18	32.1	23	24.0	28	25.7	62	23.9	22	17.6
	very often		0	0.0	2	3.6	1	1.0	9	8.3	20	7.7	20	16.0
	every time		0	0.0	0	0.0	2	2.1	2	1.8	16	6.2	5	4.0
Community volunteering activities (helping others)	never		1	100.0	19	33.9	33	34.4	45	41.3	128	49.4	68	54.4
	seldom		0	0.0	23	41.1	34	35.4	38	34.9	59	22.8	34	27.2
	sometimes		0	0.0	8	14.3	25	26.0	22	20.2	48	18.5	17	13.6
	very often		0	0.0	5	8.9	3	3.1	4	3.7	14	5.4	3	2.4
	every time		0	0.0	1	1.8	1	1.0	0	0.0	10	3.9	3	2.4
Spontaneous community donation activities	never		0	0.0	17	30.4	24	25.0	50	45.9	122	47.1	58	46.4
	seldom		0	0.0	22	39.3	32	33.3	36	33.0	68	26.3	34	27.2
	sometimes		0	0.0	10	17.9	33	34.4	19	17.4	55	21.2	26	20.8
	very often		1	100.0	6	10.7	6	6.3	3	2.8	7	2.7	4	3.2
	every time		0	0.0	1	1.8	1	1.0	1	0.9	7	2.7	3	2.4
Outdoor leisure activities (morning exercises, fitness etc.)	never		0	0.0	8	14.3	12	12.5	26	23.9	38	14.7	20	16.0
	seldom		1	100.0	21	37.5	31	32.3	19	17.4	42	16.2	11	8.8
	sometimes		0	0.0	17	30.4	30	31.3	39	35.8	63	24.3	30	24.0
	very often		0	0.0	8	14.3	19	19.8	18	16.5	68	26.3	37	29.6
	every time		0	0.0	2	3.6	4	4.2	7	6.4	48	18.5	27	21.6
Discussions on community building issues online or in meetings	never		0	0.0	21	37.5	33	34.4	53	48.6	128	49.4	64	51.2
	seldom		0	0.0	22	39.3	33	34.4	29	26.6	46	17.8	37	29.6
	sometimes		0	0.0	9	16.1	22	22.9	13	11.9	49	18.9	10	8.0
	very often		1	100.0	3	5.4	6	6.3	12	11.0	29	11.2	12	9.6
	every time		0	0.0	1	1.8	2	2.1	2	1.8	7	2.7	2	1.6
<b>Subtotal</b>			<b>1</b>	<b>100.0</b>	<b>56</b>	<b>100.0</b>	<b>96</b>	<b>100.0</b>	<b>109</b>	<b>100.0</b>	<b>259</b>	<b>100.0</b>	<b>125</b>	<b>100.0</b>

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question E10-E17 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

Firstly, we look at the results as to elections of the community neighbourhood committee: 48.2%, 46.8%, 49.0% and 48.8% of people from the age groups “20-29”, “40-49”, “50-59” and “>=60”, responded with the answer “never”, and comparably, 41.7% of people in the group “30-39” indicated that they never vote in this election. The group “30-39” displays a small drop compared to the other four groups, which implies that the surveyed people in this age range may have slightly higher involvement in the election. With respect to the results for the category “seldom”, the opposite

situation demonstrated, that is, a larger percentage of people (31.3%) aged 30-39 selected this answer. The other four groups have 23.2%, 20.0%, 16.6% and 18.4% successively in this category. As to the answer “sometimes”, no big difference exists among these groups. However, the percentages of high frequency answers (i.e. “very often” and “every time”) show a very slight increase with an increase in age. Overall, no large gaps exist among people in different age groups in participating in elections of the neighbourhood committee. With an increase in age, a slightly higher percentage of people may become highly involved in the election, particularly over 50 years old.

The situation regarding the election of the community owner committee presents some special characteristics. The last three age groups (“40-49”, “50-59” and “>=60”), particularly the last two groups, have a higher percentage of people (51.4%, 56.8%, 57.6%) who never join in this activity than the younger age groups (46.4%, 44.8%). However, the number of answers “seldom” demonstrates a reversal in that the younger groups (“20-29”, “30-39”, “40-49”) have clearly higher percentages (37.5%, 28.1%, 32.1%) than the older groups (17.0% and 20.8%). An equivalent percentage of people join in the elections with a frequency of “sometimes”. Moreover, people in the age groups “30-39”, “50-59” and “>=60” participate positively in this activity. Based on the above findings, we find that an increase in age influences people’s behaviour in participating in the elections. The situation for seniors, particularly those over 50 years old, is clearly more polarized than for younger people. In comparison to the lack of participation behaviour in younger people, a large portion of older people do not participate in the elections, while a relatively high percentage of them also join in. Furthermore, the results pertaining to the cultural activities, recreational activities, volunteering activities, spontaneous donation activities and discussions display a similar phenomenon. The participation by seniors demonstrates a relatively polarized situation, with a high occurrence of never attending and a comparatively close connection. More people at younger ages demonstrate a limited attachment to these activities. People aged 40-49 show an in-between situation, like a watershed between the older groups and the younger groups. Nevertheless, the age has noticeable links with outdoor leisure behaviours. Respondents in the older groups, particularly in the “50-59” and “>=60”, age groups, display answers highly concentrated on “sometimes”, “very often” and “every time”. The increasing possibility of participation in outdoor leisure activities with age, and the predominant degree of participation by older people, indicate that age has a positive effect to residents’ outdoor behaviour.

**Sociocultural participation by gender.** In this section, the 660 surveyed people were regrouped into two groups: male and female. As shown in Tab.11.18, this produced a total of 252 male and 408 female respondents. To summarise the situation relating to the eight sociocultural activities, the participation of the people in the two groups remained almost equivalent. In the first two election activities and the last two activities (outdoor leisure and discussions), males and females not show big differences in attendance frequency. With respect to the cultural activities, recreational activities, community volunteering activities and spontaneous activities, females responded with slightly higher percentages of “very often” and “every time” than males. For example, for participating in cultural activities, percentages for these two categories are 4.8% and 1.6% of males, and 6.1% and 3.2% of females. Similarly, percentages for recreational activity are 6.0% and 3.2% males, and 9.3% and 4.4% for females regarding the answers “very often” and “every time”. Therefore, gender seems not to affect residents’ participation in sociocultural practices. There are no recognizable differences in most activities. However, several activities (e.g. cultural exchanging, singing, dancing etc.) may be more attractive for females than males to a very slight degree.

**Tab. 11.18 Surveyed social housing residents' participation in sociocultural activities, by gender**

Activities	Frequency	Gender	Male		Female	
			abs.	%	abs.	%
Election of the community neighbourhood committee	never		114	45.2	198	48.5
	seldom		47	18.7	87	21.3
	sometimes		62	24.6	69	16.9
	very often		11	4.4	26	6.4
	every time		18	7.1	28	6.9
Election of the community owner committee	Never		127	50.4	224	54.9
	seldom		59	23.4	99	24.3
	sometimes		45	17.9	50	12.3
	very often		14	5.6	19	4.7
	every time		7	2.8	16	3.9
Cultural activities of the community centre (studies of interest or skills etc.)	never		95	37.7	166	40.7
	seldom		73	29.0	95	23.3
	sometimes		68	27.0	109	26.7
	very often		12	4.8	25	6.1
	every time		4	1.6	13	3.2
Recreational activities of the community centre (singing, dancing etc.)	never		95	37.7	135	33.1
	seldom		79	31.3	116	28.4
	sometimes		55	21.8	101	24.8
	very often		15	6.0	38	9.3
	every time		8	3.2	18	4.4
Community volunteering activities (helping others)	never		118	46.8	178	43.6
	seldom		72	28.6	121	29.7
	sometimes		49	19.4	76	18.6
	very often		9	3.6	20	4.9
	every time		4	1.6	13	3.2
Spontaneous community donation activities	never		105	41.7	168	41.2
	seldom		77	30.6	119	29.2
	sometimes		55	21.8	93	22.8
	very often		10	4.0	19	4.7
	every time		5	2.0	9	2.2
Outdoor leisure activities (morning exercises, fitness etc.)	never		42	16.7	63	15.4
	seldom		38	15.1	89	21.8
	sometimes		84	33.3	100	24.5
	very often		54	21.4	101	24.8
	every time		34	13.5	55	13.5
Discussions on community building issues online or in meetings	never		114	45.2	190	46.6
	seldom		65	25.8	108	26.5
	sometimes		41	16.3	63	15.4
	very often		27	10.7	37	9.1
	every time		5	2.0	10	2.5
<b>Subtotal</b>			<b>252</b>	<b>100.0</b>	<b>408</b>	<b>100.0</b>

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question E10-E17 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Sociocultural participation by level of education.** The 660 respondents in our survey were classified into six groups according to education level completed. Because the number of respondents in the category “other” was too small, with only one person, this discussion takes no account of this category. From low to high education, the groups are “no education”, “primary school”, “middle school”, “high school or technical secondary school” and “undergraduate study or junior college” (see Tab.11.19). With respect to joining in the election of the community neighbourhood committee, the percentages of the five groups present a slow decline in the answer “never” and a slow increase in the answer “seldom” as the educational level increases. In terms of the first election, the percentages of “never” are 53.3% for “no education” dropping to 42.3% for “undergraduate study”; and the percentages of “seldom” rise from 13.3 to 25.6%. In addition, 60.0% of people with no education people never join in the election of the community owner committee. This number decreases to 47.4% in undergraduate-educated group. With a rise in education, the results of category “seldom” grow

from 20.0%, 19.5% to 25.6%, 21.4%, and to 33.3%. However, these increases and decreases fluctuate, especially with regard to the categories “middle school” and “high school”. The changes still indicate that more educated residents may attend election activities more often, than less educated persons. Education may therefore have positive effects on participation in election activities. Less education (e.g. no education, primary school) may result in a higher possibility of no connections to the elections.

**Tab. 11.19 Surveyed social housing residents' participation in sociocultural activities, by level of education**

Education		No education		Primary school		Middle school		High school or technical secondary school		Undergraduate study or junior college		Other	
		abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Election of the community neighbourhood committee	never	8	53.3	44	57.1	95	42.6	132	49.6	33	42.3	0	0.0
	seldom	2	13.3	12	15.6	47	21.1	53	19.9	20	25.6	0	0.0
	sometimes	3	20.0	13	16.9	52	23.3	47	17.7	15	19.2	1	100.0
	very often	1	6.7	4	5.2	12	5.4	14	5.3	6	7.7	0	0.0
	every time	1	6.7	4	5.2	17	7.6	20	7.5	4	5.1	0	0.0
Election of the community owner committee	never	9	60.0	47	61.0	112	50.2	145	54.5	37	47.4	1	100.0
	seldom	3	20.0	15	19.5	57	25.6	57	21.4	26	33.3	0	0.0
	sometimes	2	13.3	10	13.0	37	16.6	37	13.9	9	11.5	0	0.0
	very often	0	0.0	3	3.9	13	5.8	14	5.3	3	3.8	0	0.0
	every time	1	6.7	2	2.6	4	1.8	13	4.9	3	3.8	0	0.0
Cultural activities of the community centre (studies of interest or skills etc.)	never	8	53.3	34	44.2	95	42.6	102	38.3	21	26.9	1	100.0
	seldom	3	20.0	25	32.5	51	22.9	69	25.9	20	25.6	0	0.0
	sometimes	2	13.3	14	18.2	60	26.9	70	26.3	31	39.7	0	0.0
	very often	0	0.0	4	5.2	13	5.8	15	5.6	5	6.4	0	0.0
	every time	2	13.3	0	0.0	4	1.8	10	3.8	1	1.3	0	0.0
Recreational activities of the community centre (singing, dancing etc.)	never	6	40.0	30	39.0	84	37.7	92	34.6	18	23.1	0	0.0
	seldom	5	33.3	20	26.0	63	28.3	83	31.2	24	30.8	0	0.0
	sometimes	2	13.3	17	22.1	52	23.3	58	21.8	27	34.6	0	0.0
	very often	2	13.3	10	13.0	17	7.6	16	6.0	7	9.0	1	100.0
	every time	0	0.0	0	0.0	7	3.1	17	6.4	2	2.6	0	0.0
Community volunteering activities (helping others)	never	8	53.3	41	53.2	102	45.7	122	45.9	23	29.5	0	0.0
	seldom	3	20.0	20	26.0	69	30.9	78	29.3	23	29.5	0	0.0
	sometimes	2	13.3	14	18.2	38	17.0	46	17.3	24	30.8	1	100.0
	very often	2	13.3	1	1.3	9	4.0	10	3.8	7	9.0	0	0.0
	every time	0	0.0	1	1.3	5	2.2	10	3.8	1	1.3	0	0.0
Spontaneous community donation activities	never	7	46.7	40	51.9	104	46.6	102	38.3	19	24.4	1	100.0
	seldom	4	26.7	23	29.9	64	28.7	81	30.5	24	30.8	0	0.0
	sometimes	2	13.3	10	13.0	45	20.2	65	24.4	26	33.3	0	0.0
	very often	1	6.7	3	3.9	6	2.7	11	4.1	8	10.3	0	0.0
	every time	1	6.7	1	1.3	4	1.8	7	2.6	1	1.3	0	0.0
Outdoor leisure activities (morning exercises, fitness etc.)	never	2	13.3	21	27.3	40	17.9	33	12.4	9	11.5	0	0.0
	seldom	2	13.3	9	11.7	43	19.3	54	20.3	19	24.4	0	0.0
	sometimes	3	20.0	14	18.2	73	32.7	67	25.2	26	33.3	1	100.0
	very often	3	20.0	24	31.2	47	21.1	63	23.7	18	23.1	0	0.0
	every time	5	33.3	9	11.7	20	9.0	49	18.4	6	7.7	0	0.0
Discussions on community building issues online or in meetings	never	7	46.7	44	57.1	111	49.8	113	42.5	29	37.2	0	0.0
	seldom	2	13.3	21	27.3	52	23.3	73	27.4	24	30.8	1	100.0
	sometimes	2	13.3	6	7.8	35	15.7	41	15.4	20	25.6	0	0.0
	very often	3	20.0	5	6.5	23	10.3	30	11.3	3	3.8	0	0.0
	every time	1	6.7	1	1.3	2	0.9	9	3.4	2	2.6	0	0.0
<b>Subtotal</b>		<b>15</b>	<b>100.0</b>	<b>77</b>	<b>100.0</b>	<b>223</b>	<b>100.0</b>	<b>266</b>	<b>100.0</b>	<b>78</b>	<b>100.0</b>	<b>1</b>	<b>100.0</b>

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question E10-E17 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

At the same time, a higher level of education (undergraduate study) obviously contributes to participation in elections. The increasing participation indicated as an increase in education level is demonstrated clearly in the results pertaining to activities involving cultural, recreational, volunteering, donation and discussions. Not only does the occurrence of the

answer “seldom” increase, but so too does the answer “sometimes”. That is to say, the gradual change in participation frequency along with education increases to some extent. Thus, education level may have strong and positive effects on residents’ involvement into the above activities. However, education seemingly has no clear effects on participation in outdoor leisure activities. Even people with no education or those with only primary school education have higher percentages for the answers “very often” and “every time”. Because a higher percentage of respondents in the more educated groups chose “sometimes”, it means that education may not strongly influence participation, but may be negatively related to participative frequency in outdoor leisure activities. Less educated people have higher frequencies of this activity than people with middle school studies and above.

**Sociocultural participation by income level.** Using every 1000 yuan as the interval, the respondents were classified into eight groups (see Tab.11.20). To summarise, we find the monthly income, 4000 yuan, is the cut-off point to distinguish participation behaviours among surveyed residents.

Firstly, this study concentrates on the results of four groups with an income below 4000 yuan. People have relatively comparable frequencies in joining in cultural, recreational or outdoor leisure activities, with no big differences among the four groups. However, in participative frequency in the election of the community owner committee and the donation activities, people with income less 2000 yuan responded at a lower level. The two groups (“2000-2999” and “3000-3999”) both present relatively higher percentages of the answers “sometimes”, “very often” and “every time”. That is to say, when income is less than 4000 yuan per month, people’s participation in the election of the community owner committee and the donation activities is positively linked to income. A particular phenomenon appears in discussions concerning community building issues online or in meetings. Compared to the three groups with 1000-3999 yuan income, respondents with below 1000 yuan income have distinctly both high percentages on the answer “very often” (18.2%) and “never” (51.5%), and very low percentages on the answer “seldom” (10.6%). This result may illuminate that these very low-income residents have more concerns about living conditions in the community.

Secondly, this study focuses on the situation of people with over 4000 yuan monthly income. Differ from people in the first four groups, there is no gradual change along with change in income; rather the situation fluctuates. Apart from outdoor leisure activities, people in the groups “4000-4999” and “6000-6999” always present the lowest percentages for the answer “never” and outstandingly high levels for the answers “seldom” and “sometimes”, even compared to the first four groups. By contrast, people from the groups “5000-5999” and “>7000” have clearly high rates on the answer “never”. In addition, the total number of the answers “never” and “seldom” always stay at the highest level compared to the rest of the six income groups. This fluctuating result may reveal that when residents’ income level exceeds 4000 yuan, their participation behaviours in most sociocultural activities may not strictly change with income. This unstable phenomenon is particularly obvious in the frequency of the categories “never”, “seldom” and “sometimes”, and not as significant regarding the answers “very often” and “every time”. We would conclude that with income over 4000 yuan, participation of residents in sociocultural activities may not be associated with income level. Nevertheless, outdoor leisure activities demonstrate a special situation. The differences between groups occur irregularly and neither an increase nor a decrease appears along with the income level. This situation may imply that income has no link with the participation behaviour of residents.

Tab. 11.20 Surveyed social housing residents' participation in sociocultural activities, by income

		Income (yuan)		<1000		1000-1999		2000-2999		3000-3999		4000-4999		5000-5999		6000-6999		>7000	
Activities	Frequency	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Election of the community neighbourhood committee	never	31	47.0	53	49.1	49	51.6	47	46.5	34	37.8	41	57.7	21	38.2	36	48.6		
	seldom	7	10.6	15	13.9	19	20.0	23	22.8	26	28.9	15	21.1	12	21.8	17	23.0		
	sometimes	14	21.2	22	20.4	17	17.9	20	19.8	23	25.6	9	12.7	13	23.6	13	17.6		
	very often	6	9.1	11	10.2	4	4.2	7	6.9	1	1.1	2	2.8	3	5.5	3	4.1		
	every time	8	12.1	7	6.5	6	6.3	4	4.0	6	6.7	4	5.6	6	10.9	5	6.8		
Election of the community owner committee	never	41	62.1	63	58.3	53	55.8	53	52.5	33	36.7	43	60.6	23	41.8	42	56.8		
	seldom	10	15.2	20	18.5	24	25.3	28	27.7	30	33.3	15	21.1	14	25.5	17	23.0		
	sometimes	10	15.2	15	13.9	11	11.6	13	12.9	19	21.1	5	7.0	11	20.0	11	14.9		
	very often	3	4.5	7	6.5	4	4.2	5	5.0	2	2.2	5	7.0	4	7.3	3	4.1		
	every time	2	3.0	3	2.8	3	3.2	2	2.0	6	6.7	3	4.2	3	5.5	1	1.4		
Cultural activities of the community centre (studies of interest or skills etc.)	never	30	45.5	46	42.6	38	40.0	43	42.6	21	23.3	33	46.5	20	36.4	30	40.5		
	seldom	13	19.7	34	31.5	22	23.2	18	17.8	30	33.3	16	22.5	11	20.0	24	32.4		
	sometimes	18	27.3	22	20.4	27	28.4	36	35.6	29	32.2	14	19.7	18	32.7	13	17.6		
	very often	2	3.0	6	5.6	5	5.3	2	2.0	6	6.7	6	8.5	5	9.1	5	6.8		
	every time	3	4.5	0	0.0	3	3.2	2	2.0	4	4.4	2	2.8	1	1.8	2	2.7		
Recreational activities of the community centre (singing, dancing etc.)	never	27	40.9	44	40.7	30	31.6	42	41.6	20	22.2	21	29.6	21	38.2	25	33.8		
	seldom	16	24.2	33	30.6	28	29.5	26	25.7	25	27.8	24	33.8	17	30.9	26	35.1		
	sometimes	16	24.2	19	17.6	22	23.2	22	21.8	34	37.8	17	23.9	11	20.0	15	20.3		
	very often	5	7.6	11	10.2	11	11.6	8	7.9	5	5.6	5	7.0	4	7.3	4	5.4		
	every time	2	3.0	1	0.9	4	4.2	3	3.0	6	6.7	4	5.6	2	3.6	4	5.4		
Community volunteering activities (helping others)	never	32	48.5	52	48.1	44	46.3	49	48.5	32	35.6	36	50.7	23	41.8	28	37.8		
	seldom	11	16.7	32	29.6	22	23.2	28	27.7	27	30.0	22	31.0	16	29.1	35	47.3		
	sometimes	15	22.7	20	18.5	23	24.2	14	13.9	24	26.7	10	14.1	12	21.8	7	9.5		
	very often	5	7.6	4	3.7	5	5.3	8	7.9	3	3.3	1	1.4	1	1.8	2	2.7		
	every time	3	4.5	0	0.0	1	1.1	2	2.0	4	4.4	2	2.8	3	5.5	2	2.7		
Spontaneous community donation activities	never	33	50.0	53	49.1	41	43.2	44	43.6	29	32.2	31	43.7	16	29.1	26	35.1		
	seldom	13	19.7	29	26.9	28	29.5	21	20.8	30	33.3	25	35.2	20	36.4	30	40.5		
	sometimes	15	22.7	22	20.4	23	24.2	27	26.7	21	23.3	12	16.9	16	29.1	12	16.2		
	very often	2	3.0	4	3.7	2	2.1	7	6.9	8	8.9	1	1.4	1	1.8	4	5.4		
	every time	3	4.5	0	0.0	1	1.1	2	2.0	2	2.2	2	2.8	2	3.6	2	2.7		
Outdoor leisure activities (morning exercises, fitness etc.)	never	13	19.7	21	19.4	16	16.8	18	17.8	13	14.4	8	11.3	9	16.4	7	9.5		
	seldom	7	10.6	19	17.6	20	21.1	19	18.8	17	18.9	17	23.9	11	20.0	17	23.0		
	sometimes	21	31.8	36	33.3	22	23.2	28	27.7	27	30.0	19	26.8	15	27.3	16	21.6		
	very often	13	19.7	23	21.3	23	24.2	24	23.8	21	23.3	15	21.1	12	21.8	24	32.4		
	every time	12	18.2	9	8.3	14	14.7	12	11.9	12	13.3	12	16.9	8	14.5	10	13.5		
Discussions on community building issues online or in meetings	never	34	51.5	55	50.9	41	43.2	44	43.6	37	41.1	36	50.7	30	54.5	27	36.5		
	seldom	7	10.6	26	24.1	30	31.6	26	25.7	28	31.1	20	28.2	10	18.2	26	35.1		
	sometimes	11	16.7	18	16.7	13	13.7	15	14.9	14	15.6	11	15.5	8	14.5	14	18.9		
	very often	12	18.2	9	8.3	9	9.5	10	9.9	9	10.0	3	4.2	6	10.9	6	8.1		
	every time	2	3.0	0	0.0	2	2.1	6	5.9	2	2.2	1	1.4	1	1.8	1	1.4		
<b>Subtotal</b>		<b>66</b>	<b>100.0</b>	<b>108</b>	<b>100.0</b>	<b>95</b>	<b>100.0</b>	<b>101</b>	<b>100.0</b>	<b>90</b>	<b>100.0</b>	<b>71</b>	<b>100.0</b>	<b>55</b>	<b>100.0</b>	<b>74</b>	<b>100.0</b>		

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question E10-E17 (see in Appendices A.2). Surveyed by Chao, R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Sociocultural participation by type of family.** As introduced in section 11.1.1.1 on the type of family, the labels of the first four groups are authorized by local government according to economic ability and social status. Because there is no clear response about what family type would be in category "other", the analysis in this section will pay little attention to the results of this group. Both low-income family and low-insurance family belong to the lower economic group, but the latter group also refers to an added condition about social status. Poor households are also a confirmed type by income level, with an economic ability even lower than the level of low-income family. Overall, the percentages of the five types display three levels. These are respectively: 1) low-income family and low-insurance household; 2) poor household; 3) special family and common family. Therefore, a discussion classified in terms of these three groups may provide us with detailed information on sociocultural participation.

At first, the study focuses on the data related to low-income families and low insurance families. In comparison with the two groups in every frequency category, no big differences appear between them. Except for the election of the neighbourhood committee and the outdoor activity, the results of the other six activities demonstrate very small gaps (under 3%) between the two family types in each category. In addition, with respect to participation in the election of neighbourhood committees, low-insurance families had slightly higher percentages for the answers “sometimes” and “very often” than low-income family; 24.2% and 12.1% of respondents from low-insurance families responded that they participate in the election with a frequency of “sometimes” and “very often”. The two percentages for low-income families are respectively 16.3% and 7.3%. In addition, 10.2% of low-income people join in the election every time and 6.1% of low-insurance people attend every time. In sum up, no clear difference exists between the two groups in terms of participation in elections. Nevertheless, low-income residents display a higher participation frequency in outdoor activities than low-insurance residents; 23.1% and 15.6% of the first group join in with very high frequency, which is higher than the 19.7% and 9.1% of the low-insurance group to some extent. Members of low-income families may have slightly higher involvement than those of low-insurance family on outdoor leisure. To conclude the above findings, we may find that people in the two kinds of family (low-income and low insurance), with weakly economic ability, have similar behaviours in joining most sociocultural activities except for outdoor activities.

The group “poor household” only had six respondents. As the sample set is too small it may give very limited and inaccurate information. In viewing the distribution of respondents in the five frequency categories, we can get an idea that most people in poor families never participate in many sociocultural activities. Active participation is only apparent in outdoor leisure activities. One interviewee joins in sometimes, two people often do so and another one person does so every time. In general, people from poor families may display lower participation in most sociocultural activities than those from other family types.

This study then turns to the third group with the other two families: special family and common family. As a whole, the two types both demonstrate lower percentages on the answer “never” and higher levels on “sometimes” and “seldom” than first three family types with lower income levels. This phenomenon is particularly noticeable in activities related to the election of owner committees, cultural communication, recreation, volunteering and donations. That is to say, the frequency of participation in sociocultural activities may be related to the family type, particularly those classified as having limited income. A greater percentage of residents from low-income families, low insurance families and poor families may not participate in the above activities, while at the same time, the involvement of people from special families and common families demonstrates a higher level. According to the results pertaining to outdoor leisure, neither special families nor common families present distinct high or low percentages to the first three families. The comparably equal level proves that the family type may have little effect on residents’ participation in outdoor leisure activities. In addition, special families display a very high percentage, 68.0%, for the category “never” in activity “discussions”. This means that people from special families may be less concerned about community issues and rarely participate in spontaneous discussions in the community.

Nevertheless, there are also some differences existed between special families and common families. In recreational activities, volunteering activities and donations, people from special families demonstrate greater involvement over those from common families. The percentages of the two groups for every category are unstable, but the total percentage of positive categories, “sometimes” “very often” and “every time”, is always at a high level for special families. Respondents from the two family types display an equivalent level of participation in election activities. Moreover, common families demonstrates some advantages in joining cultural activities. The internal features of the family type may bring out these differences. As we know, members of special families are more likely to be widowed, elderly, disabled and/or veterans’ relatives. Hence, these characteristics may contribute to their high presence in volunteering, donation or recreational activities.

**Tab. 11.21 Surveyed social housing residents' participation in sociocultural activities, by type of family**

Activities		Frequency	Family		Low-income family		Low insurance household		Poor household		Special family <sup>a</sup>		Common family		Other	
			abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%		
Election of the community neighbourhood committee	never		73	49.7	31	47.0	2	33.3	12	48.0	188	46.8	6	42.9		
	seldom		24	16.3	7	10.6	1	16.7	5	20.0	94	23.4	3	21.4		
	sometimes		24	16.3	16	24.2	1	16.7	7	28.0	80	19.9	3	21.4		
	very often		11	7.5	8	12.1	0	0.0	1	4.0	15	3.7	2	14.3		
	every time		15	10.2	4	6.1	2	33.3	0	0.0	25	6.2	0	0.0		
Election of the community owner committee	never		89	60.5	38	57.6	5	83.3	14	56.0	202	50.2	3	21.4		
	seldom		27	18.4	11	16.7	0	0.0	5	20.0	112	27.9	3	21.4		
	sometimes		16	10.9	12	18.2	0	0.0	5	20.0	59	14.7	3	21.4		
	very often		6	4.1	4	6.1	1	16.7	1	4.0	19	4.7	2	14.3		
	every time		9	6.1	1	1.5	0	0.0	0	0.0	10	2.5	3	21.4		
Cultural activities of the community centre (studies of interest or skills etc.)	never		68	46.3	33	50.0	4	66.7	6	24.0	144	35.8	6	42.9		
	seldom		31	21.1	14	21.2	1	16.7	12	48.0	109	27.1	1	7.1		
	sometimes		37	25.2	16	24.2	1	16.7	7	28.0	109	27.1	7	50.0		
	very often		7	4.8	3	4.5	0	0.0	0	0.0	27	6.7	0	0.0		
	every time		4	2.7	0	0.0	0	0.0	0	0.0	13	3.2	0	0.0		
Recreational activities of the community centre (singing, dancing etc.)	never		63	42.9	29	43.9	4	66.7	8	32.0	122	30.3	4	28.6		
	seldom		42	28.6	19	28.8	1	16.7	6	24.0	124	30.8	3	21.4		
	sometimes		24	16.3	12	18.2	1	16.7	6	24.0	109	27.1	4	28.6		
	very often		10	6.8	6	9.1	0	0.0	4	16.0	32	8.0	1	7.1		
	every time		8	5.4	0	0.0	0	0.0	1	4.0	15	3.7	2	14.3		
Community volunteering activities (helping others)	never		79	53.7	34	51.5	5	83.3	7	28.0	167	41.5	4	28.6		
	seldom		31	21.1	15	22.7	0	0.0	10	40.0	134	33.3	3	21.4		
	sometimes		25	17.0	15	22.7	0	0.0	6	24.0	76	18.9	3	21.4		
	very often		7	4.8	1	1.5	1	16.7	2	8.0	14	3.5	4	28.6		
	every time		5	3.4	1	1.5	0	0.0	0	0.0	11	2.7	0	0.0		
Spontaneous community donation activities	never		80	54.4	34	51.5	5	83.3	8	32.0	141	35.1	5	35.7		
	seldom		30	20.4	16	24.2	1	16.7	8	32.0	140	34.8	1	7.1		
	sometimes		30	20.4	14	21.2	0	0.0	9	36.0	92	22.9	3	21.4		
	very often		4	2.7	2	3.0	0	0.0	0	0.0	19	4.7	4	28.6		
	every time		3	2.0	0	0.0	0	0.0	0	0.0	10	2.5	1	7.1		
Outdoor leisure activities (morning exercises, fitness etc.)	never		24	16.3	16	24.2	2	33.3	6	24.0	56	13.9	1	7.1		
	seldom		25	17.0	11	16.7	0	0.0	2	8.0	86	21.4	3	21.4		
	sometimes		41	27.9	20	30.3	1	16.7	7	28.0	110	27.4	5	35.7		
	very often		34	23.1	13	19.7	2	33.3	7	28.0	94	23.4	5	35.7		
	every time		23	15.6	6	9.1	1	16.7	3	12.0	56	13.9	0	0.0		
Discussions on community building issues online or in meetings	never		67	45.6	30	45.5	2	33.3	17	68.0	186	46.3	2	14.3		
	seldom		33	22.4	14	21.2	0	0.0	5	20.0	117	29.1	4	28.6		
	sometimes		27	18.4	14	21.2	0	0.0	1	4.0	57	14.2	5	35.7		
	very often		15	10.2	8	12.1	4	66.7	1	4.0	34	8.5	2	14.3		
	every time		5	3.4	0	0.0	0	0.0	1	4.0	8	2.0	1	7.1		
<b>Subtotal</b>			<b>147</b>	<b>100.0</b>	<b>66</b>	<b>100.0</b>	<b>6</b>	<b>100.0</b>	<b>25</b>	<b>100.0</b>	<b>402</b>	<b>100.0</b>	<b>14</b>	<b>100.0</b>		

Note: <sup>a</sup> Special family refers to households that obtain financial assistance or in-kind subsidies (e.g. housing) from the government based on special reasons such as being widowed, elderly, disabled, veterans' relatives and the like.

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question E10-E17 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

### 11.1.2 Social communication

As indicated, developing relationships with neighbours is not necessary for an individual's primary relationships (Philliber, 1976: 232-233). Relationships with neighbours not have to be formed unless an attractive reason for doing so. Such reasons would be linked to personal characteristics (e.g. gender, social status, educational background, income level etc.) or the environment in which he/she lives (Philliber, 1976: 231). Hence, it makes sense to analyse personal network relating to the number of friends, new friends, and communicative situations (e.g. contact frequency, conflicts, activity etc.). Various social backgrounds and residential environments may affect the individuals' degree of integration into their social environment.



In line with the purpose of the study, the analysis here is designed to test the consequences of daily contacts between people within/outside the residential neighbourhood in order to explain social communication. Selected indicators aim to indicate social communication from three aspects: social ties of respondents, contacts within the community and interactions between peripheral commercial areas and the social housing communities (see Tab.10.1). The social ties were indicated by the number of friends and relatives respondents had in the current residential environment, and Questions D11, D12 and G2 (see Appendices A.2) point to facts relating to friends, while Questions F14 and F15 are about connections with relatives. Then, Questions D1-D10 directly reflect the reality of communications between people living in the same social housing community. Finally, the remaining questions in part F aim to answer to what degree the respondents interact with people in the peripheral neighbouring communities.

#### 11.1.2.1 Social ties in new living area

In order to understand the social network within a community currently and to know its development in a new living environment, this study counted and compared the number of friends and new friends and the weight of new friends to identify. In Tab.11.22, we counted the numbers and percentages for categories for survey questions D11, D12 and G2 as obtained from 660 respondents. The first two questions use the same ascending scales from “none” “1-4” “5-9” “10-20” to “>20”. Then, the cross tabulated results in Tab.11.23 obtained from survey questions D11 and D12, reveals the weight of new friends within the people’s friend network. The 660 respondents were divided into five groups (i.e. “none”, “1-4”, “5-9”, “10-20” and “>20”) according to their total numbers of friends in their residential communities, then the composition of each group is shown by the proportions of classified new friends. These data can reveal how many of the current friends within communities are new. In other words, after resettling in social housing communities, how important are the new friends in the respondents’ social networks.

Firstly, based on the surveyed frequencies in Tab.11.22, respondents’ new social networks within the social housing communities would appear to be effectively built up after they resettled. As shown in the left and the middle columns of Tab.11.22, 5.2% of interviewees have no friends within their current communities, and even fewer people, 4.4%, have not made any new friends in their daily lives in the community. This small number of people who have no friends in new community may indicate that most residents in social housing communities are in touch with their new neighbours. Subsequently, the five categories and the corresponding percentages increase in parallel. The interviewees who have 1-4 friends in the community comprise 14.2%, which is nearly three times higher than the proportion of the category “none”. Further, this growth trend rises to 20.3%, 28.9% and to 31.4% in successive categories. Over 80% of the 660 respondents have more than five friends, and over 60% of them have more than 10 friends. Similar results can be found with new friends. Small differences show that a few more respondents chose the middle three categories, and the percentage of people with over 20 new friends drops to 26.5%, slightly lower. In addition, the composition of friends have been shown by the classified new friends in Tab.11.23, from which the importance of new friends can be recognized. The majority of new friends constitute the main component in an individual’s social network within the community. As to people who have 1-4 friends, 68.1% of them have 1-4 newly made friends and 61.2% of people who have 5-9 friends answered they have made 5-9 new friends in community. Similarly, 71.2% and 72.5% of people indicate “10-20” friends and “>20” new friends, respectively.

Secondly, the contact of surveyed residents with people in neighbouring communities was indicated as very seldom. By comparing the data in Tab.11.22, more than 36.2% of respondents have not made friends with people in the peripheral community, while only 4.4% of them have no new friends in their living community. At the same time, people who have made 10-20 and >20 new friends in the neighbouring community amounts to 14.4% and 19.9%, respectively. They are much lower than percentages within the same community, 30.8% and 26.5%. It may be that the surveyed people have more contact with people in the community than those living in neighbouring communities.

The above discussion about the number of friends not only illuminates that the social networks of most respondents are good, but also shows that new friends are essential in a personal social network. The 660 respondents were chosen randomly from the 13 communities. Therefore, it should be accepted that residents in social housing communities have successfully established own social networks within the community where they live rather than outside and new friends form a predominant part of these networks.

**Tab. 11.22 The number of friends and new friends after moving into social housing communities**

	The number of friends within community		The number of new friends within community				The number of new acquainted people from peripheral community			
	abs.	%	abs.		%		abs.		%	
none	34	5.2	none	29	4.4	none	237	36.2		
1-4	94	14.2	1-4	110	16.7	<10	193	29.5		
5-9	134	20.3	5-9	143	21.7	10-20	94	14.4		
10-20	191	28.9	10-20	203	30.8	20-50	100	15.3		
>20	207	31.4	>20	175	26.5	>50	30	4.6		
Total	660	100.0	Total	660	100.0	Total	654 <sup>a</sup>	100.0		

Note: <sup>a</sup> 6 answers are missing.

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question D11, D12 & G2 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Tab. 11.23 The weight of new friends among the friends in the community**

		The number of new friends within community										Total	
		none		1-4		5-9		10-20		>20			
		abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
<b>The number of friends within community</b>	none	12	35.3	10	29.4	3	8.8	3	8.8	6	17.6	34	100.0
	1-4	11	11.7	64	68.1	14	14.9	3	3.2	2	2.1	94	100.0
	5-9	3	2.2	21	15.7	82	61.2	24	17.9	4	3.0	134	100.0
	10-20	2	1.0	11	5.8	29	15.2	136	71.2	13	6.8	191	100.0
	>20	1	0.5	4	1.9	15	7.2	37	17.9	150	72.5	207	100.0
	Total	29	4.4	110	16.7	143	21.7	203	30.8	175	26.5	660	100.0

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question D11 & D12 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

### 11.1.2.2 Respondents' social contact with various people

In the above discussions, we find that the majority of surveyed people have built up good personal relationships in the new community. This section goes further to analyse what kind of people respondents would be likely to develop an intimate relationship with. In the survey, respondents were required to mark the most applicable response from five categories to reflect their intimacy with defined groups of people. Seen from Tab.11.24, five sub categories of contact frequency are "never", "rarely", "normal", "often" and "very often". High contact frequency implies a close or personal communication, while low contact frequency would suggest a distant relationship between people. With respect to the people groups, our survey listed ten groups according to their personal characteristics and living environment (see Tab.11.24). The first four groups were classified by the geographical location of their residence. Then, social identity, the type of dwellings and hobbies were used as other indicators. Comparing the contact frequency with various people is helpful for ascertaining the factors that may influence social communication among residents in social housing communities.

Firstly, as seen from the results in Tab.11.24, the contact frequency of surveyed people may be significantly influenced by the residential location. The shorter the distance between the homes of respondents and the targeted people, the higher frequency the contact would be. It is noticeable that the area of a communities may become a watershed for the contact frequency. Contact behaviours with surrounding people show big differences between within and outside communities. The answers contain five scales from very negative to very positive. 37.7% of 660 respondents often get in touch with people who live in same building and in same community, and 14.1% and 8.9% of them communicate very often. In comparison, only 15.3% and 4.4% of respondents opted for "often" and "very often" with people in the neighbouring community. At the same time, their percentages in the two negative categories "never" and "rarely" present much higher levels, 13.9% and 36.4% respectively. As to people within the same community, the percentages of answers "never" and "rarely" drop to 1.1% and 16.7%. The two percentage fall to an even lower level, with 0.6% and 14.2% in the group of people who live closer (in the same building). In addition to the negative effects of residential distance, the old personal network in the former community still continues. Although living in a new environment, contact with people in the former community is also important in personal communication. We can see from Tab.11.24 that

28.3% and 9.8% of respondents regularly (often or very often) get in touch with their old neighbours, and 23.2% and 6.4% rarely or never contact with old neighbours. This frequency is a bit lower than the contact with new neighbours in a community, but much higher than the contact with people who are spatially nearby but in different communities.

Secondly, contact frequency is greatly distinguished by social identity. In line with the results in Tab.11.24, respondents reflect much higher intimacy with old Guangzhou residents than those new Guangzhou residents. 36.5% of respondents often contact people with identity of old Guangzhou residents, while only 16.7% often contact new Guangzhou residents. These two groups have 18.0% and 35.2% respectively of people with a negative answer “rarely”. Thirdly, the survey shows no big differences in contact between people in low-rent housing and those in EAH. The housing type would appear not to have an effect on respondents’ behaviour in daily communication. The comparable percentages of people in the two groups is very similar for all five responses.

Eventually, cultural activities and voluntary activities may have a different influence on the communicative behaviour of the surveyed people. Broadly speaking, the respondents may have more contact with people who like community cultural activities than those who participate in voluntary activities. This difference is revealed by the higher percentages of respondents giving the positive answers “often” and “very often”, 25.0% and 4.7% respectively, in regard to their interactions with people who like cultural activities. Among the 660 respondents, 11.7% is often in touch with volunteers in social welfare activities and 3.6% of them connect very often. Simultaneously, much smaller percentages of respondents gave negative answers “never” and “rarely” in regard to interacting with people in cultural activities than with people in voluntary activities.

**Tab. 11.24 The frequency of contact with people with various personal characteristics and living environments**

People groups	Contact frequency		never		rarely		normal		often		very often		Total	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
people in the same building	4	0.6	94	14.2	220	33.3	249	37.7	93	14.1	660	100.0		
people in the same community	7	1.1	110	16.7	235	35.6	249	37.7	59	8.9	660	100.0		
people in the neighbouring community	92	13.9	240	36.4	198	30.0	101	15.3	29	4.4	660	100.0		
people in former old community	42	6.4	153	23.2	213	32.3	187	28.3	65	9.8	660	100.0		
old Guangzhou residents	26	3.9	119	18.0	175	26.5	241	36.5	99	15.0	660	100.0		
new Guangzhou residents	40	6.1	232	35.2	256	38.8	110	16.7	22	3.3	660	100.0		
low-rent housing residents	37	5.6	169	25.6	271	41.1	148	22.4	35	5.3	660	100.0		
economic housing residents	40	6.1	158	23.9	270	40.9	157	23.8	35	5.3	660	100.0		
people loves community cultural activities	63	9.5	201	30.5	200	30.3	165	25.0	31	4.7	660	100.0		
volunteers of social welfare activities	135	20.5	236	35.8	188	28.5	77	11.7	24	3.6	660	100.0		

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question D1-D10 (see in Appendices A.2). Surveyed by Chao, R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

In summary, social contacts may closely linked to the residential community, established personal network and the social identity. Residents in social housing communities show more interaction within the community than outside the community. No matter geographically near or distant, respondents still maintain their connections with old neighbours. At the same time, the old Guangzhou residents display more contact with the surveyed social housing residents than the new Guangzhou residents.

However, these results only indicate the probable influences that may lead to different behaviours among the surveyed people. The characteristics of the surveyed people and residential environments should not be overlooked as they also significantly affect personal social contacts. Owing to a lack of information on respondents, the results displayed in Tab.11.24 do not reveal the degree of influence that these factors have on respondents in terms of various characteristics such as age, gender, education, income, scale of community and so on. Accordingly, to define the influence of a factor on the basis of general results may produce mistakes. For example, an effective factor may be concealed because of the opposite effect it has on male respondents and female respondents. The following analyses therefore focus on the personal characteristics of respondents and attempt to learn whether people can be affected by the living community, social identity and such external elements.

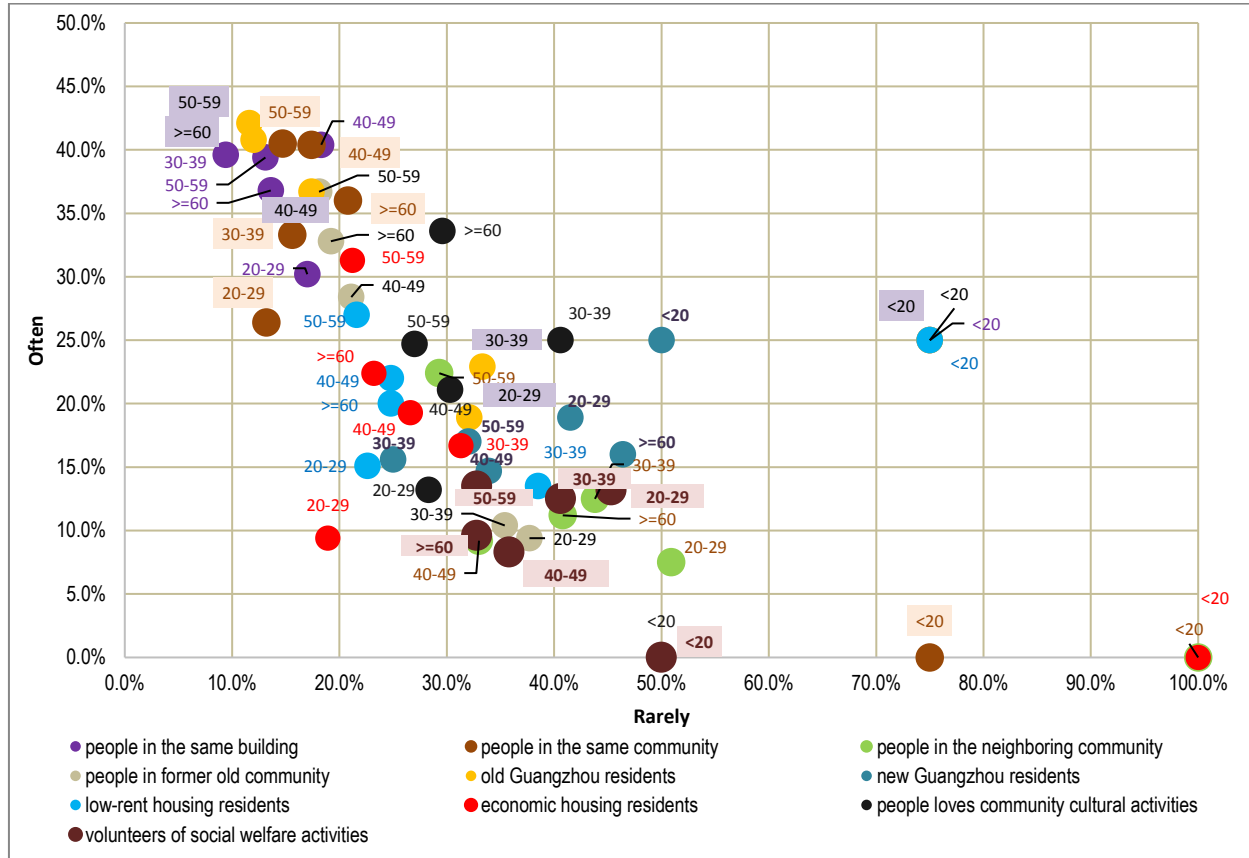
The analyses below will discuss the contact frequencies of respondents separately, firstly by personal characteristics such as age, gender, educational background, and income level, and then by residential environment, namely, construction time, scale and mixed type of community. Neither logistic regression nor binary regression works when a dependent variable has five categories, as five categories have two that are negative, two that are positive, and one that is neutral. This feature makes it possible to compress the five answers into two dimensions. Generally speaking, the majority of results demonstrate a normal distribution in terms of the five categories (see in Tab.11.24). The percentages of the very negative answer “never” and the very positive answer “very often” are mostly small, while the neutral answer “normal” takes up the highest percentage. In terms of this situation, we picked the category “rarely” to represent the negative dimension, and uses the category “often” to represent the positive dimension. Despite this method reducing the original information, simplified dimensions of “rarely” and “often” have remained the most valuable information for further analysis.

**The effect of age on respondents’ contact behaviours.** The percentages of categories “rarely” and “often” are shown on the horizontal axis and the vertical axis respectively. The scatter plot makes use of colours to divide 10 groups of people into different living environments or personal characteristics. Every series contains six subcategories which are classified by the age of the respondents. Therefore, the results of each age group depict a point (see Fig.11.1). This way of comparing the distribution of the points of every series may allow us to see how age relates to personal preferences in daily communication. It should be noted that the analysis in Fig.11.1 ignores the results of the age group “<20” by reason of its small sample size of only four cases.

The links between the age and the contact frequency with various groups of people are of two types: no significant connection or a linear relation. No significant differences were found between respondents of different ages in terms of their contacts with people who live in the same building, in the same community, in the neighbouring community, and new Guangzhou residents and volunteers who are keen on social welfare activities. Firstly, the concentrated distribution of points of the first two groups (people in the same building & people in the same community) in the left top area indicates intimate contact between them and all respondents. That is to say, no matter what ages the respondents are, they have similar communicative frequencies with these two groups of people. The upper left location means that the people included have a high proportion of the answer “often” and few responses to the answer “rarely”. Particularly among the surveyed people over 30 years old, nearly 35.0 to 40.0% demonstrate frequent interactions with people who are in same building or the same community, and a much small percentage in the range of 10.0 to 20.0%, who rarely get in touch with people in the same living space. Then, the points of two series, people in the neighbouring community and volunteers, lie mainly in the lower centre area. However, respondents aged 50-59 clearly show that a higher percentage of them answered “often” and fewer answered “rarely”. In the figure, no clear connections are shown to prove any effects of the age on the communicative behaviours of these two groups of people. Eventually, the points of the series “new Guangzhou residents” also present no clear differences among respondents in age groups.

The rest of series displays a decreasing linear relation as age increases; hence, the age of respondents may strongly affect their contact with people in their former community, old Guangzhou residents, low-rent housing residents and EAH residents, and people who love cultural activities. Firstly, with respect to the contact with people in the former community and old Guangzhou residents, the older respondents indicated more frequent connections than the younger respondents, particularly for the respondents over 40 years old. As we can see from Fig.11.1, the three points which symbolize respondents in the age ranges of “50-59” “>60” and “40-49”, concentrate in the left top area and decrease successively. The two points which correspond to the age groups “30-39” and “20-29”, drop in the middle centre area with a large gap and also demonstrate a decreasing trend. To take the series “old Guangzhou residents” as an example, people included in respondents age groups of “50-59” and “>60” have over 40.0% of the answer “often” and approximately 10.0% of the answer “rarely”. In age group “40-49”, the ratios of “often” to “rarely” are 36.7% and 17.4% respectively. As to the group “30-39”, its percentage of the answer “often” sharply drops to 22.9%. This number falls again to 18.9% in the group “20-29”. Therefore, we may conclude that age strongly influences the contact with old neighbours and old Guangzhou residents. Surveyed people who are older, particularly over 40 years old, may have closer links to their old neighbours and old local residents, but the links of young people below 40 years greatly decrease. Compared to older residents, young residents in social housing communities may depend less on old relationships, and their social contacts may be less related to their identity. Secondly, age also has a positive

relationship with contact with low-rent housing residents, EAH residents and people loves cultural activities. The results of these three series present a similar evenly falling trend as age decreases. To take the EAH residents as an example, respondents aged “50-59” who often contact these groups of people take up 31.3%. This then falls to 22.4%, 19.3%, 16.7%, 9.4% for the age groups “>60”, “40-49”, “30-39” and “20-29”.



**Fig. 11.1 Contact of the respondents with various groups people, by age**

Note: 660 surveyed people were classified into 6 groups according to their ages. Only percentages are shown in this figure, and the total number of the group “<20” is n = 4, and n = 53 in age group “20-29”, n = 96 in group “30-39”, n = 109 in group “40-49”, n = 259 in group “50-59”, n = 125 in group “>60”, respectively.

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities of Guangzhou (n = 660), Question D1-D10 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

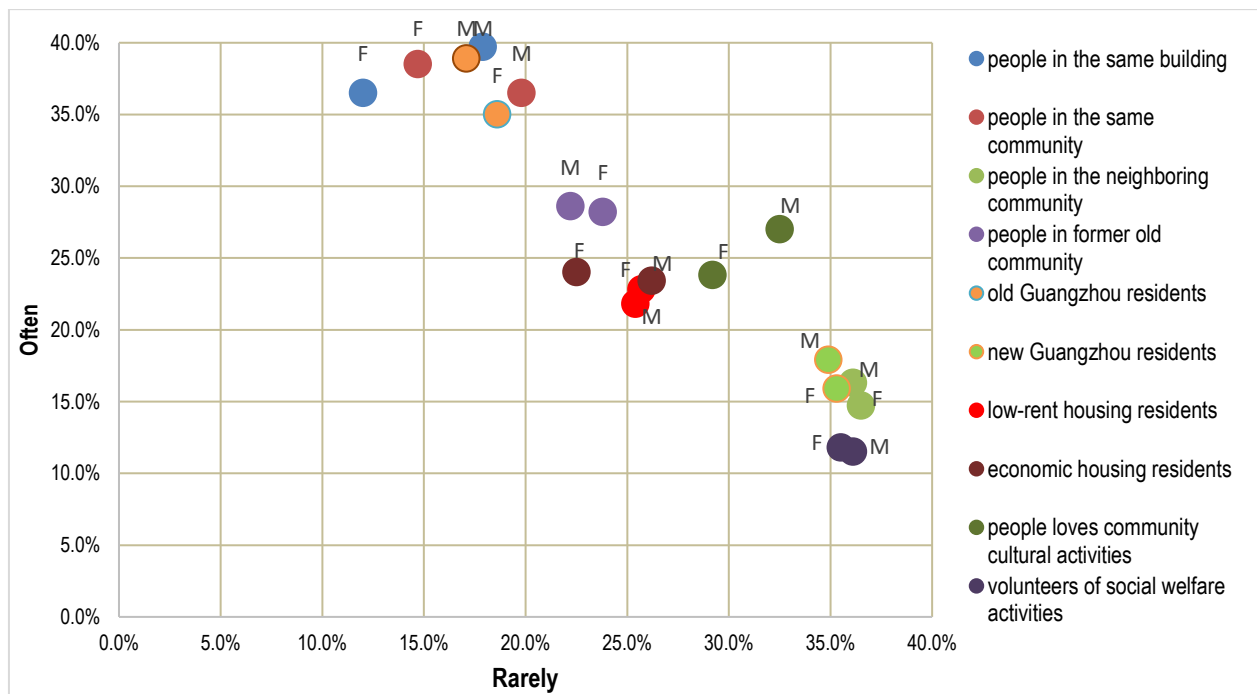
**The effect of gender on respondents’ contact behaviours.** In this section the study aims to discover the differences between male and female respondents in terms of their normal communications. Fig. 11.2 indicates the contact frequencies of male and female with ten kinds of groups of people. The horizontal axis indicates the percentage of the answer “rarely” and the vertical axis shows the percentage of the answer “often”. A dot lies in the left top area, which indicates high contact frequency because a large proportion of people often visit their friends and a very small percentage of people rarely contact their friends. Therefore, by observing the location and distance of the every two dots in a series, we are able to ascertain in what situation the surveyed male and female respondents may display different contact behaviours. The close location of the dots representing males and females implies that no significant differences exist between them and that contact frequency is very similar. Contrary to the proximity, the distance between two points may indicate rather different behaviours between the genders. In other words, gender would be a factor that causes different communicative frequency.

In terms of the distance between two dots in each series, gender can be identified as a factor which effectively differentiates the contact frequency of respondents with following groups: people in the same building, people in the same community, old Guangzhou residents, EAH residents and people who likes community activities. In addition,

there are two relations between the two genders. The first situation is the high contact frequency of one gender over the other since one gender has higher level on “often” and a lower level on “rarely”. The second situation is the polarized contact frequency of a gender because of both higher weights on “often” and “rarely”.

Firstly, female respondents indicate more frequent contact with people in the same community and residents in EAH, while male respondents have closer contacts with old Guangzhou residents. The frequency of females’ daily communication is more likely to be affected by the geographical range of residential space and the dwelling type of targeted people. Unlike females, behaviour of males is less related to the current living environment of people and more to the social identity. As seen from Fig.11.2, 38.9% of male respondents often contact old Guangzhou residents, while slightly less female respondents, 35.0%, often stay in contact with them. Inversely, female respondents responded with a higher proportion (18.6%) than males (17.0%) in terms of a contact frequency of “rarely”.

Secondly, as to contact with people in the same building and those who likes local cultural activities, male respondents demonstrated greater divergence than females. Both the weight of the answer “often” and the answer “rarely”, present higher levels in males. This result indicates the communicative frequency of male respondents is seemly more affected by cultural activities and the very close neighbourhoods. For instance, 17.9% of male respondents, and a lesser amount of females, 12.0%, rarely have contact with people in the same building. At the same time, male respondents also have a larger percentage in the regard (39.7%) than the 36.5% of females who often get in touch with people in the same building.



**Fig. 11.2 The contact frequency of surveyed people with various people groups, by gender**

Note: “M” is “male”, “F” is “female”. The total number of male and female are 252 and 408 respectively.

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question D1-D10 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

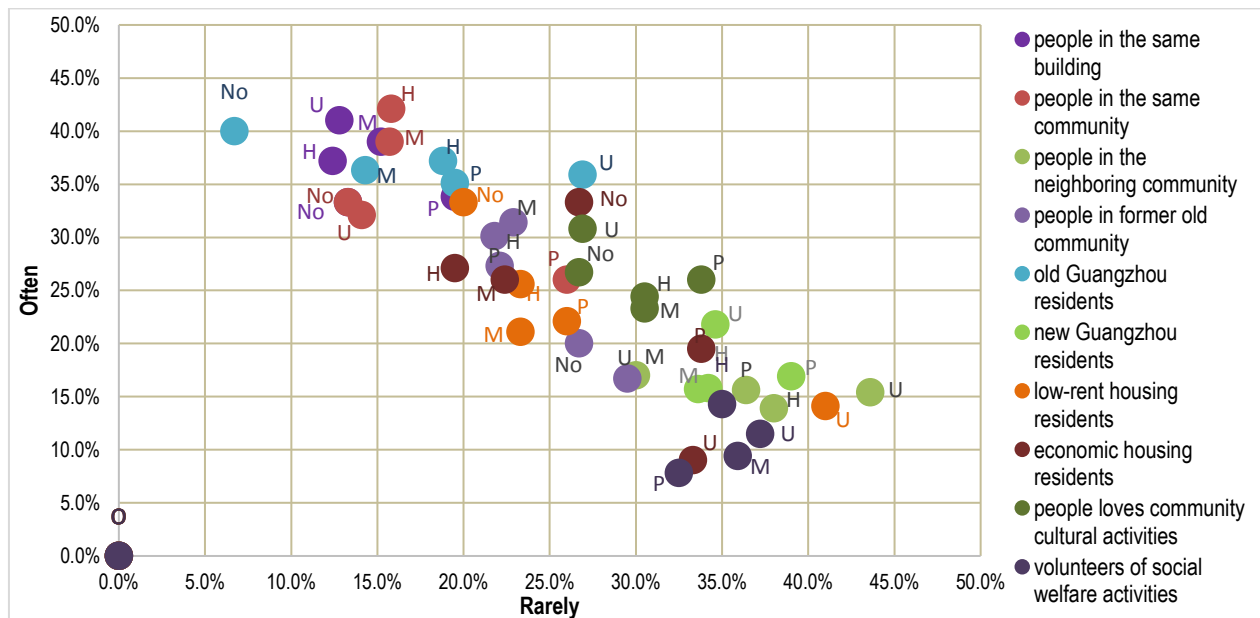
**The effect of education on respondents’ contact behaviours.** The analysis focuses on the situations of respondents with different educational levels. By examining the concentration and dispersal of dots in a series, it is possible to know what impact education has on their daily communication. Respondents were divided into six ordinal groups in terms of the highest education level achieved: people with no education, people who completed primary school education, people who completed middle school education, people with high school education or technical secondary school education, people who have completed undergraduate study or junior college and people with an even higher level of

education. Because only one person among the 660 had achieved the “other” educational level, we exclude this group and only consider the results for the other five groups here. A concentrative distribution indicates a high consistence among all respondents, that means, different educational background may cause few divergences between respondents’ contact frequency. Otherwise, the education may be a factor that has an effect on people’s communications.

Owing to the distribution of the dots in the scatter plot and no clear uniformity in terms of an increase in education, we find that contact frequency with people in the same building and with people who like voluntary activities is rarely linked to individual’s education. In addition, the dots of the series “people in the same community” and “EAH residents”, demonstrate a large dispersion without rules. Therefore, this scattering may not be the outcome of educational difference.

In regard to contact with the rest of the people groups, the behaviours of respondents in the middle three groups with medium educational background (primary school, middle school and high school) display high consistency. This indicates that only respondents with no education or a high level of education would indicate a distinct contact frequency. Drawing from Fig.11.3, we reduce the impact from the low- or high- education to two groups: the first effect is the increase in education which may be negatively related to the frequency of communication with neighbouring community residents, old Guangzhou residents and low-rent housing residents. In addition, respondents with no education display the highest contact frequency with them, but they show less contact with people in their former communities than medium educated respondents have. The second effect is a positive relation. Along with the increase of educational level, respondents may have increasing contact with new Guangzhou residents and people who love community cultural activities.

Thus, highly educated respondents may have more contact with new Guangzhou residents while less educated people have closer contact with old Guangzhou residents, low-rent housing residents and neighbouring community residents. This situation implies that education has some effects on an individual’s social network. The social network established with very close, very local and vulnerable persons is more important for less educated social housing residents. At the same time, contact with new citizens in Guangzhou is more frequent for people with more education.



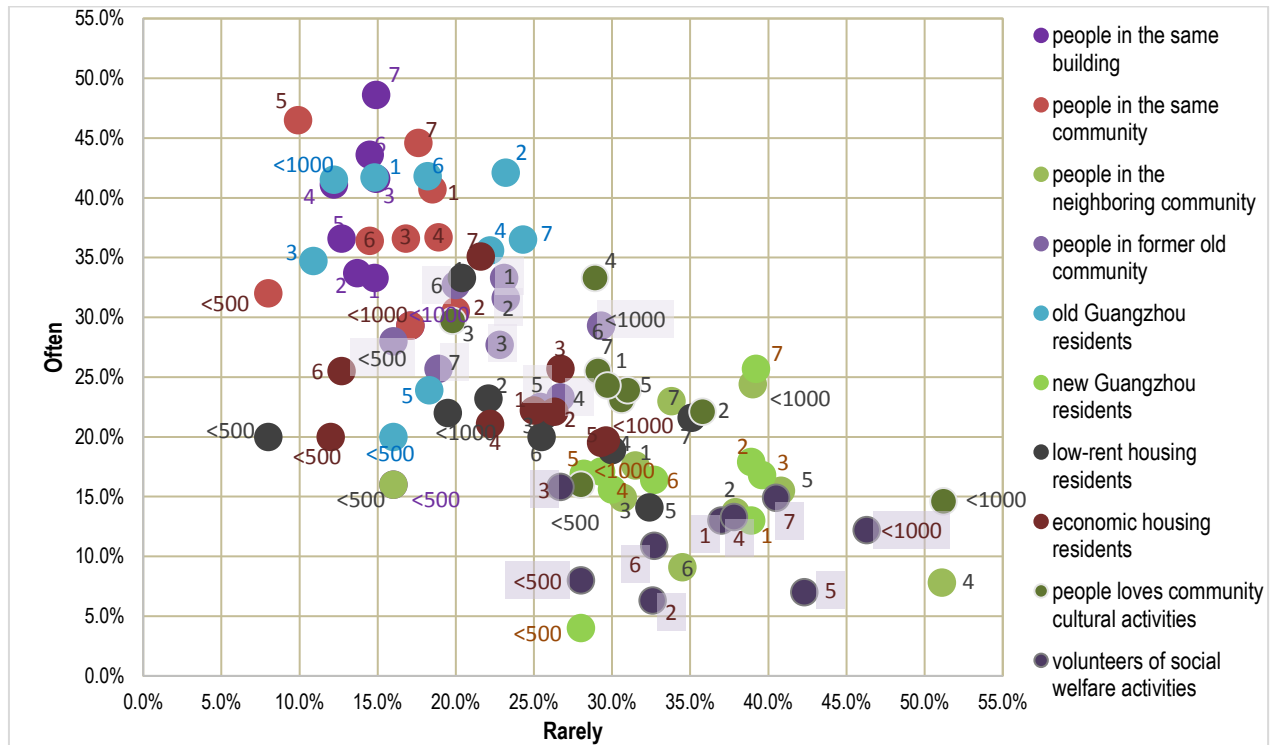
**Fig. 11.3 The contact frequency of surveyed people with various people groups, by educational level**

Note: “No” is “no education”, n = 15; “P” is “primary school”, n = 77; “M” is “middle school”, n = 223; “H” is “high school or technical secondary school”, n = 266; “U” is “undergraduate study or junior college”, n = 78; “O” is “other”, n = 1.

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question D1-D10 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**The effect of income on respondents' contact behaviours.** The 660 respondents were divided into nine levels in terms of income level from low to high (see Fig. 11.4). Because the series shows no linear relationships with increasing/decreasing incomes, we consider that income level has no significant effects that are strictly along the income level. As seen from the Fig.11.4, the income of respondents has no effect on their contact to these groups of people (people in the same community, people in the neighbouring community, people in former old community, old Guangzhou residents, people who loves cultural activities and volunteers of social welfare activities).

Then, income may positively relate to the initiative of respondents to interact with neighbours, particularly those in the same building. With increased income, the percentages of people who often contact neighbours in the same building displays an increasing trend. High-income respondents have more frequent contact with very close neighbours than low-income respondents. Further, increasing income is positively linked to contact with residents in EAH but negatively linked to the contact with residents in LRH. Dots of series "low-rent housing residents" display a flat trend line. The dots signifying higher income has larger values on the horizontal axis. This indicates that communication with residents in LRH reduces as income increases. Inversely, the dots in the series "EAH residents" presents an opposite trend. According to the rule that only low-income households are allowed to apply for LRH, and middle- and low-income families should go into EAH, it is rational to assume that residents in EAH generally have higher incomes than those in LRH. Therefore, we can assume that the income level plays an important role in contact between people with different economic abilities. Nevertheless, the series "new Guangzhou residents" also indicates an increasing trend as income ascending. The higher the income of the group, the higher the weight of the contact frequency "often" (or the lower the weight of the contact frequency "rarely"). New Guangzhou residents refers to a people group who relocated in Guangzhou by reason of their jobs or suchlike. As having a social status of Guangzhou may reflect the economic ability of the person to some extent. To sum up, high-income respondents seem prefer to contact residents with better economic ability, while low-income respondents show more frequent contact with people with lower economic ability.



**Fig. 11.4 The contact frequency of surveyed people with various people groups, by income level**

Note: "<500" is "<500 yuan", n = 25; "<1000" is "500-999 yuan", n = 41; "1" is "1000-1999 yuan", n = 108; "2" is "2000-2999 yuan", n = 95; "3" is "3000-3999 yuan", n = 101; "4" is "4000-4999 yuan", n = 90; "5" is "5000-5999 yuan", n = 71; "6" is "6000-6999 yuan", n = 55; "7" is ">7000 yuan", n = 74.

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities of Guangzhou (n = 660), Question D1-D10 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.



**The effect of the dwelling mode of community on respondents' contact behaviours.** Additional to personal characteristics, objective factors like the living space or residential conditions of the community may also directly/indirectly influence the willingness to engage or the behaviour of inhabitants in daily interactions. For example, if the dwelling mode in fully mixed it may provide more chances for interaction between spatially proximate people than non-mixed communities. So the mixed mode may be assumed to be a positive factor in reducing social identity barriers among contacts. Comparing the differences between the results of respondents in different communities, may provide us a method to ascertain what kind of social housing community (i.e. size, dwelling mode, construction & location) would be helpful for residents' social interactions.

This section focuses on the effects of mixed mode housing in a community. In terms of the design of social housing communities, the 13 communities have been divided into three types. The first one is the community with all types of social housing built during different periods. Within community "F", LRH, EAH, ANJU & JIEKUN housing are evenly mixed in some buildings. The three old communities, Zede, Tangde, Jude and Jide belong to this type. The second type is the community "H" which comprise LRH and EAH. The two housing types are spatially separated by buildings or the inner borders of geographical units. This kind of half-mixed community was launched after 2005 and has been used as the main mixed mode in social housing projects. It includes Jinshazhou, Fanghe, Guangdna, Guocun and Tai'an. The third type "S" only contains EAH, because these communities are normally established on small land parcels. Anxia, Dang'en, Huize Yaxuan and Likang are designed with this dwelling mode.

Firstly, fully mixed communities are helpful for residents in developing better inner social contacts, and simultaneously may lead to fewer contacts with people who are geographically outside the living unit. Compared to the respondents from communities which were designed with half mixed and single dwelling modes, people in fully mixed communities demonstrate the highest frequency in contacting people in the same community. However, respondents in fully mixed communities fall behind in interactions with most the people groups. This gap is particularly clear in interactions with people in neighbouring communities, people in the former community, and people who likes cultural activities. Thus, the fully mixed type may be positively linked to contacts within the community area rather than outside the community. Additional to a lack of contacts across communities, interview results also reflect a higher occurrence of inner separation. In-depth interviews were conducted with both managers and inhabitants in six communities (i.e. Zede, Tangde, Jide, Jude, Fanghe, Jinshazhou). While the first four communities are a fully-mixed type of design, the last two communities are designed according to the half-mixed type. In talking with them, people have responded with different interactions between inner inhabitants.

*The social separation is serious between residents of economically affordable housing and low-rent housing. They have strong conflicts in daily life, particularly in fully mixed residential areas of community (south-western unit of Phase II). The conflicts between people of two housings are much less in the residential sections (south-eastern unit of Phase II) in half-mixed dwelling type. From my own perspective, half-mixed type is the best way for inner interactions. Residents in two types of housing share certain space for public activities, but not too frequent.*

*-- Xian Liu, the manager of Zede community*

*Compared to other communities, Tangde has severe social separation within the geographic unit. Government identified the qualification of most of the residents here in living low-rent housing. They commonly have lowest incomes, mental and physical problems.*

*-- Zhongyi Tong, the manager of Tangde community*

*We have a lot of contact. Neighbours in low-rent housings like to come for gatherings. People here are quite human.*

*-- Guoqiang Tan, a resident of low-rent housing in Tangde community*

*My contacts with low-rent housing are quite few. They are living in the area where is a bit far. We have different topic.*

*-- Mrs Tang, a resident of economically affordable housing in Tangde community*

*Surrounded housings are all low-rent housing. We have good relationships and concern for each other. However, the interactions with people of economically affordable housing are a bit less.*

*-- Mr Zhang, a resident of low-rent housing in Jude community*

According to my working experiences, there are some communication obstacles between residents of low-rent housing and those of economically affordable housing. The buildings of low-rent housing are located at the rear row with some distance to buildings of economically affordable housing. Their areas for public activities have some differences. However, the management in Fanghe have greatly improved their interactivities.

-- Xiongbing Zhou, the manager of Fanghe community

I am get along with my neighbours, I also have a lot of contacts with people of economically affordable housing.

-- Mr Liang, a resident of low-rent housing in Fanghe community

I have more contact with households of economically affordable housing, because of child's issue.

-- Mrs Li, a resident of low-rent housing in Fanghe community

I have a lot of contact with neighbours, we are usually talking together. Totally no ideas who is low-income housing household.

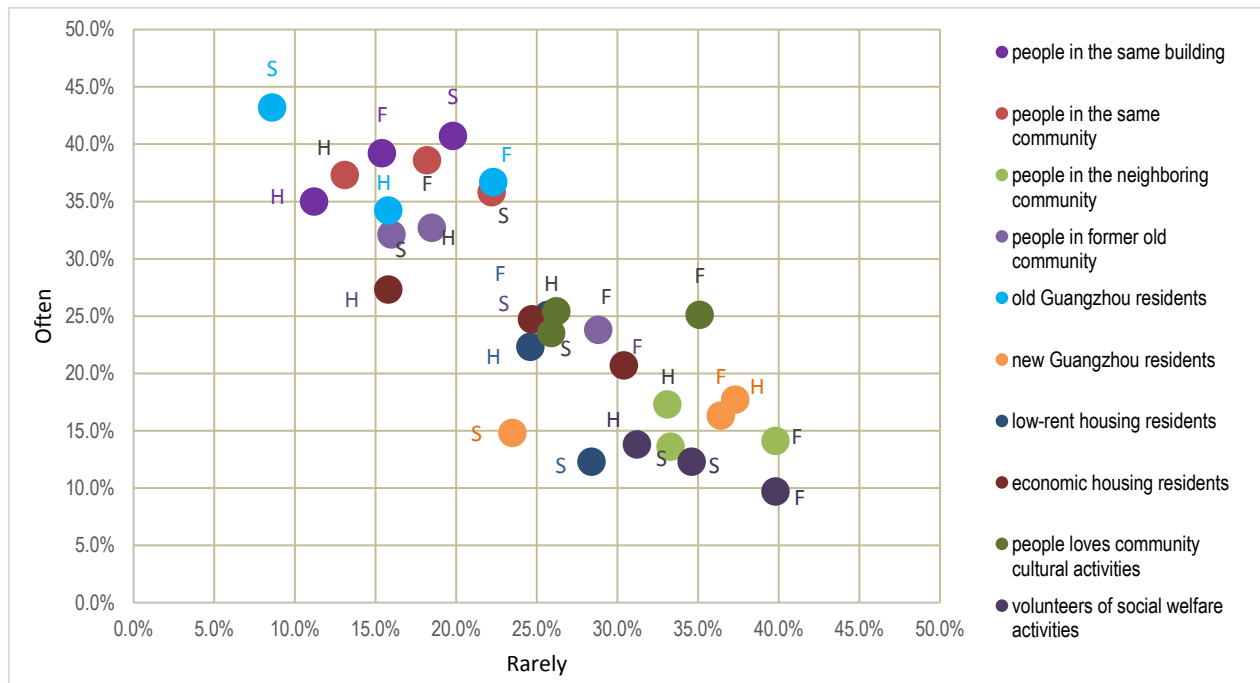
-- Mr He, a resident of low-rent housing in Fanghe community

The neighbour relationships are quite good here. I haven't find any communication problems between two kinds of residents. It seems that I have a bit less interaction with household of low-rent housing, because they are living in another area.

-- Mr Luo, a resident of low-rent housing in Fanghe community

Therefore, the social contact of respondents in fully mixed communities strongly depend on proximate neighbours than on any other kinds of people. There was a greater likelihood of both inner separation and outside separation existed in fully mixed communities than in half-mixed or single communities.

Secondly, the half mixed community may have advantages for residents in establishing multiple social connections. As shown in Fig.11.5, respondents of "H" mostly lie in the leading position in terms of contact frequency with various people. This advantage is particularly significant in contact with residents in EAH. The development of social relations may be less constrained by distance, geographic border, and difference in identity or lifestyle. Considering these facts, the half mixed community can be identified as the better dwelling mode for residents for establishing multiple social networks.



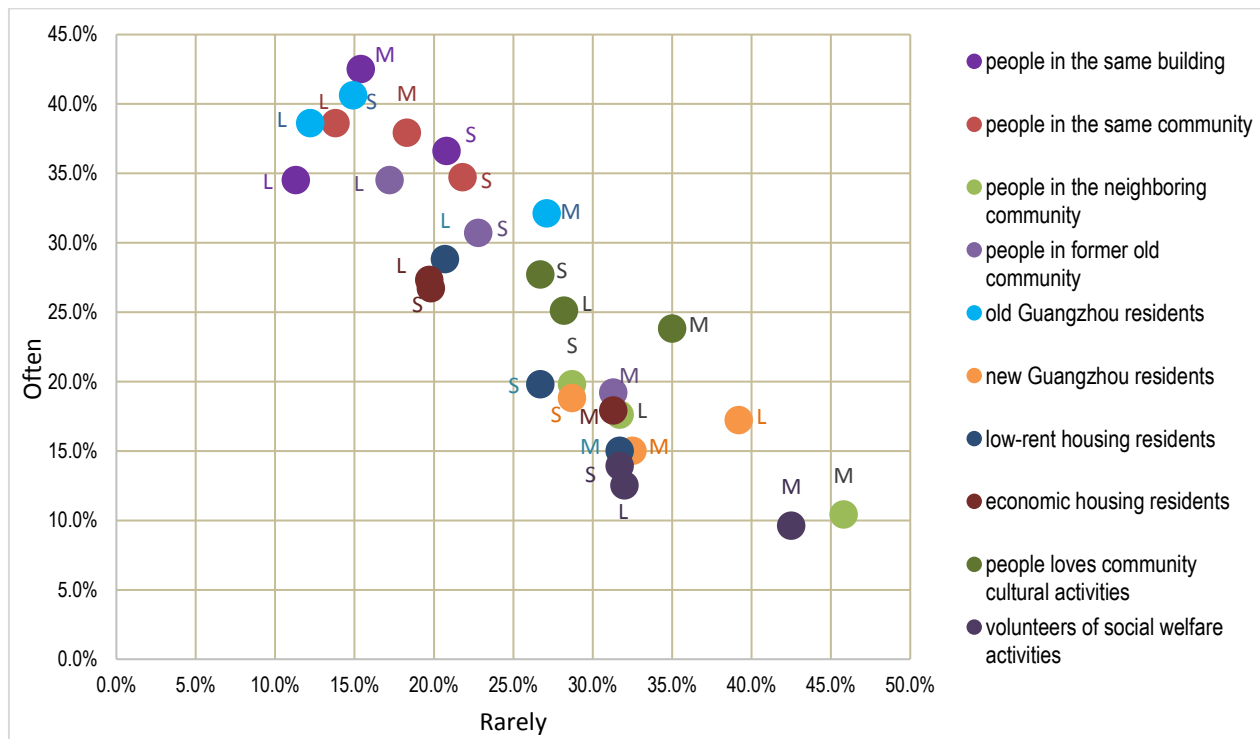
**Fig. 11.5 The contact frequency of surveyed people from various people groups, by mixed type of community**

Note: "F" refers to "the fully mixed community with low-rent housing, economically affordable housing and ANJU housing", n = 319; "H" refers to "the mixed community with low-rent housing and economically affordable housing", n = 260; "S" refers to "the non-mixed community with only economically affordable housing".

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question D1-D10 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**The effect of the size of community on respondents' contact behaviours.** The 13 surveyed communities were divided into three groups in terms of the housing design and the number of residents. This study defines a large-scale community as a social housing community with over 4000 people. A medium-size community refers to one with 1500-3000 people and a community with fewer than 1500 people is regarded as a small-scale community. A high value on vertical axis means a large proportion of the group often contact targeted people, and a low value on horizontal axis indicates the number of people who rarely contact the targeted group is small. Therefore, meeting both conditions implies a closer connections between the respondents and the targeted people, and vice versa.

The first result observed from Fig.11.6 is that there is less contact frequency by respondents in medium-size communities. It is notable that the points "M" (which symbolizes respondents from medium-size communities), mostly lie to the right and below the location of the points of "L" (which refers to respondents from large-size communities) and "S" (which refers to respondents from large-size community). This phenomenon appears in most series, except for the first two groups of "people in the same building" and "people in the same community". This location implies that a higher proportion of respondents of "M" rarely get in touch with the majority of people groups, while fewer of them demonstrate frequent interactions. Therefore, respondents from middle-size communities are more likely to have close connections with their neighbours who are spatially near, particularly those in the same community. However, their connections with other people who live at a distance or who are different (e.g. people in neighbouring communities, people in former communities, or old Guangzhou residents), are distinctly fewer. As a result, middle-size communities (contains 1500-4000 population) may be linked to a strong dependence of personal social contact on the living space. Living in middle-size communities may have some effects on intimate inner connections but may constrain contacts outside the community.



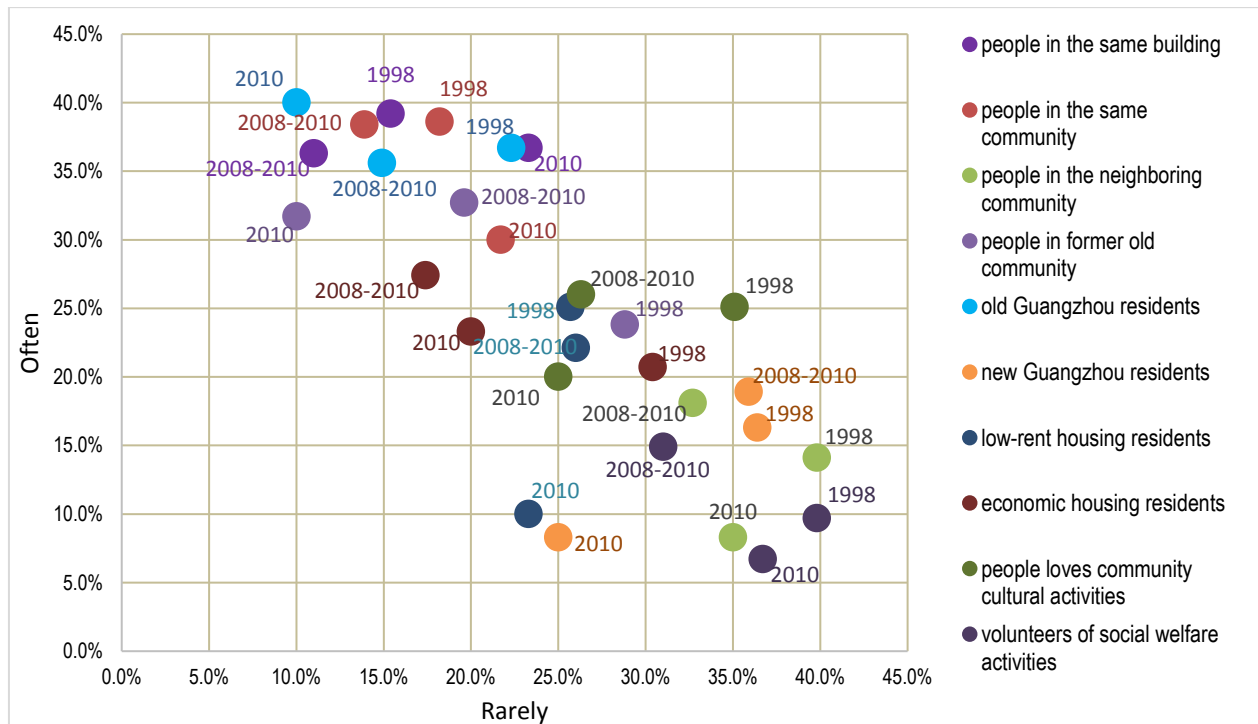
**Fig. 11.6 The contact frequency of surveyed people with various people groups, by size of the lived community**

Note: "L" refers to "community in large scale (>4000 population)", n = 319; "M" refers to "community in middle scale (1500-3000 population)", n = 240; "S" is "community in small scale (< 1500 population)", n = 101.

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question D1-D10 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

In comparison, the communication of people in large- and small-size communities (with over 4000 people or with under 1500 people) seems less limited by the distance, geographic borders of residence area, differences in social identity and personal hobbies. Nevertheless, small communities demonstrate advantages in contacts with neighbouring communities, new Guangzhou residents, and people who love cultural or voluntary activities. These facts may manifest in respondents in small-size communities having more contact with different people. Their social contact seems more varied and is less influenced by boundary lines between residences. The smaller the community, the more contacts across the borders of communities they may have.

**The effect of the length of residence on respondents' contact behaviours.** This section aims to discover the relationship between the length of residence and personal social contacts. The 13 surveyed social housing communities were classified into three groups in line with the time of construction (see Fig.11.7). Obviously, people in the communities built earlier have lived in the communities longer. The first type of community is the one that was constructed in 1998 and extended afterwards. The people included here have lived in the community for over 10 years. The second type refers to communities developed during 2008-2010 when the second round of social housing construction was proposed by local government. At the time of the research the residents have a two to three years length of residence. And the third type refers to communities launched after 2010. Therefore, residents in the three kinds of communities have different lengths of occupancy. Respondents of the third group have the shortest occupancy which is less than one year.



**Fig. 11.7 The contact frequency of surveyed people with various people groups, by construction time of the residential community**

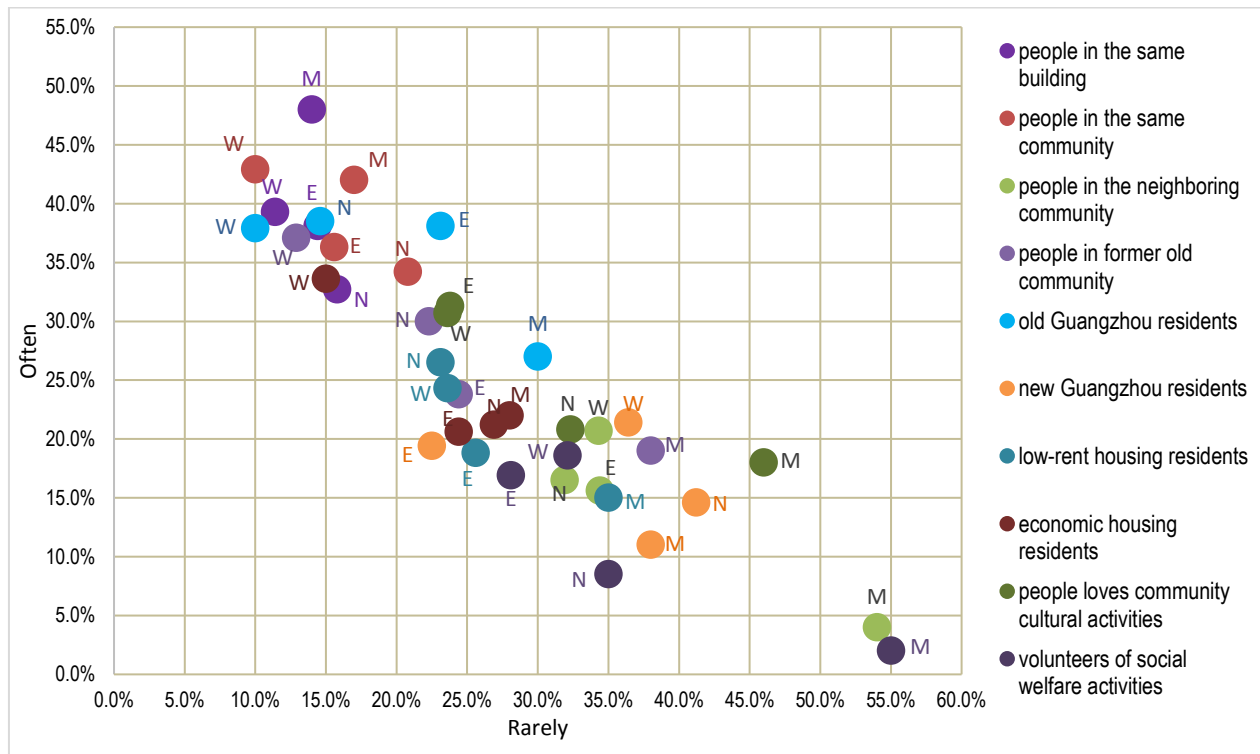
Note: "1998" means "the community built from 1998", n = 319; "2008-2010" refers to "the community built in 2008-2010", n = 281; "2010" refers to "the community built after 2010", n = 60.

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities of Guangzhou (n = 660), Question D1-D10 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

In comparison with people with longer occupancy, respondents who had just moved in show less contact frequency with neighbours in the same building or in the same community, and with people in the neighbouring community. As assumed, the group "2010" (community built after 2010) demonstrates smaller values on the vertical axis and larger values on the horizontal axis in contacting people who are spatially proximate. In addition, people in the group "2010" have higher frequency of contacting people in the former old community and old Guangzhou residents. These imply

that locally based social contacts are not well established among new social housing residents. This may be a result of the short length of occupancy. Nevertheless, surveyed residents in communities developed in 2008-2010 demonstrate the best connections with proximate inhabitants or people with different social identities or hobbies. Therefore, it would appear to that the longer occupancy does not necessarily relate positively to the intimacy of communications with local people. Occupancy length of two to three years is enough for residents to build up their social networks around their homes.

**The effect of the location of the community on respondents' contact behaviour.** The analysis in this section focuses on the possible effects of the residential location on residents' interaction with various people. The study divided the 660 surveyed people into four groups based on the location of the housing (see Fig.11.8). "W" refers to those who live in communities (Fanghe, Dang'en and Guocun) which are situated in the western area of Guangzhou city. "M" means people who live in communities (Jude) in the middle of Guangzhou. Similarly, the group labelled "N" contains five communities (Zede, Jide, Jinshazhou, Huize Yaxuan and Likang) which are located in the northern area, and the group of "E" comprises four communities (Tangde, Guangdan, Anxia and Tai'an) that lie in eastern area of Guangzhou.



**Fig. 11.8 The contact frequency of surveyed people with various people groups, by location of the lived community**

Note: "W" is "the community located in western cluster", n = 140; "M" is "the community located in middle cluster", n = 100; "E" is "the community located in eastern cluster", n = 160; "N" is "the community located in northern cluster", n = 260.

Source: own draft, 2017. Data source: Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question D1-D10 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

Compared to respondents in the western, northern and eastern areas, those who live in social housing communities in the middle of Guangzhou have closer contact with their neighbours within a same community, but much less contact with other people in different communities, social identities or personal hobbies. This gap is clearly shown in Fig.11.8. When developing relationships with people with different characteristics, they have high preference to contact spatially proximate neighbours. We may consider residents located in communities in the middle of Guangzhou as being strongly dependent on the housing community. At the same time, respondents in the western area indicated that they had the most contact with various people than those in the northern and eastern areas. These facts indicate that respondents of the western area may have better social connections, which is likely less to be affected by the distance, boundary lines between living units, differences in personal identities or hobbies. Lastly, the point 'E' in the series 'new Guangzhou

residents' demonstrates a distinct weight on the horizontal axis. This means a smaller percentage of respondents located in the eastern are think their connections with new Guangzhou residents rarely happen. This indirectly tells us that respondents who live in communities located in the east of the city have more contacts with new Guangzhou residents than respondents in other locations.

### 11.1.2.3 Social interactions with residents in neighbouring communities

The segregation/integration of residents in social housing communities is mainly reflect in their interactions and connections with the surrounding people and socioeconomic environment. The above analyses have discussed the contact frequency with different people, and this section focuses on the contacts with people in neighbouring communities. We intend to reveal whether communities that consist of vulnerable households become such geographic units that are treated differently by citizens. Accordingly, the interactions between residents and the people close by can assist in answering this question. Firstly, the proximity of residence can let us ignore the effects caused by the location in the city. Then, buildings in the peripheral communities are mostly commercial buildings, and majority of inhabitants are ordinary citizens with general values or attitudes. Therefore, the district in which they live and the heterogeneity of social identity of neighbouring inhabitants ensure that the samples are meaningful for a reliable examination of social segregation. Apart from the 660 questionnaires administered in social housing communities, our survey also investigated 60 people in three peripheral communities of Fanghe, Jinshazhou and Jude. The following analysis focuses on the frequency and difficulty of interactions and individual activities, as well as and psychological trust towards each other.

**Tab. 11.25 Contact frequency, difficulties, activities and mutual trust in communication with people in peripheral commercial/social housing communities**

		Respondents of social housing communities (n=660)		Respondents of commercial housing communities (n=60)	
		abs.	%	abs.	%
The frequency of visiting commercial/social community	never	330	50.0	15	25.0
	occasionally	254	38.5	30	50.0
	about once a month	26	3.9	1	1.7
	about once a week	28	4.2	8	13.3
	very often	22	3.3	6	10.0
The frequency of cooperation on social activities with people in commercial/social community	never	418	63.3	44	73.3
	very seldom, once to twice a year	181	27.4	8	13.3
	sometimes, once to twice a month	49	7.4	5	8.3
	often, about once to twice a week	5	0.8	1	1.7
You have difficulties in communication with surrounding commercial/social housing residents	yes	349	52.9	29	48.3
	no	311	47.1	31	51.7
Commercial/social housing residents actively communicate with you	yes	189	28.6	18	30.0
	no	471	71.4	42	70.0
You actively communicate with surrounding commercial/social housing residents	yes	215	32.6	21	35.0
	no	445	67.4	39	65.0
You trust neighbours in surrounding commercial/social housing community	absolutely not	13	2.0	0	0.0
	not really	71	10.8	12	20.0
	so-so	432	65.5	29	48.3
	yes	139	21.1	19	31.7
	yes, a lot	5	0.8	0	0.0
<b>Subtotal</b>		<b>660</b>	<b>100.0</b>	<b>60</b>	<b>100.0</b>

Source: own draft, 2017. Data source: 1) 660 Questionnaires conducted in 13 social housing communities in Guangzhou (n = 660), Question F1, F6, and F7-F10 (see in Appendices A.2). 2) 60 questionnaires in three neighbouring communities of Fanghe (n = 20), Jinshazhou (n = 20) and Jude (n = 20). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

Firstly, personal visits probably take place more often than cooperation between the two kinds of communities. In order to find out the intimacy of connections between surveyed residents in social housing communities and peripheral commercial housing communities, the study has calculated the frequency of interactions: personal visits and cooperation relating to social activities (see Tab.11.25). Questions contain five categories from “never” to “very often”: 50.0% of respondents in social housing never visit neighbouring communities, and up to 63.3% never have any cooperation. At the same time the total percentage of people who visit the neighbouring community more than one time per month reached 11.4% (which consists of 3.9% visit once a month, 4.2% visit it once a week, and 3.3% visit it very often), while the percentage of monthly cooperation reveals a frequency of 9.3%. At the same time, the respondents of commercial housing communities presented parallel outcomes (see Tab.11.25). Clearly the occurrence of personal visits is higher than cooperation among respondents from two close communities.

Secondly, compared to respondents in social housing, surveyed people in commercial housing communities demonstrate higher frequencies of visiting social housing communities; they even have more activities and fewer difficulties in interacting with residents of social housing communities. This result is manifested by the higher weights for this group on answers “frequent visits” and less weight on the answer “never occurs”. As shown in Tab.11.25, 50.0% of respondents in social housing never visit commercial housing communities, in turn, only 25.0% of respondents in commercial housing never do this. In comparison, a much higher percentage of respondents in commercial housing often visit social housing than the reverse: 13.3% of these people visit social housing once a week, and 10.0% of them visit very often. By contrast, the percentage of respondents in social housing who have a frequency of once a week and very often are only 4.2% and 3.3%, respectively. The greater activity on the part of commercial housing respondents can be proved by the higher percentages of positive answers. Compared to 32.6% of social housing respondents, 35.0% of commercial housing respondents actively communicate with surrounding social housing residents. Nevertheless, the surveyed people appear to be more positive in their interaction than people of the other side are. In the survey conducted in the social housing communities, 28.6% of respondents thought residents of commercial housing actively communicates with them, and 32.6% of respondents held that they actively communicate. Similarly, the investigation of commercial housing residents showed that 35.0% of surveyed people actively communicate but only 30.0% affirmed the activity of people on the other side.

Thirdly, individuals' trust towards residents of commercial/social housing communities appears to differ between respondents from the two sides. The majority of social housing respondents (65.5%) present moderate trust because responses highly concentrated on the answer “so-so”. In addition, 10.8% do not really trust commercial housing residents while 21.1% do so. However, the trust felt by surveyed people from commercial housing demonstrates a polarization. People with moderate trust take up 48.3%, while 20.0% of them do not really trust social housing residents and 31.7% state that they do. These facts may indicate that trust on the part of social housing residents may be more moderate, while trust displayed by commercial housing residents is polarized in two opposite directions with a higher percentage of people holding both positive and negative attitudes.

To conclude, despite the fact that interaction between the two groups is not so frequent, the situation does not seem to result in exclusionary behaviour from neighbouring residents. Residents of buildings surrounding social housing show greater interaction with social housing residents than the reverse. That means even if segregation between social housing communities and the surrounding communities exists locally, it cannot be attributed to the attitudes or behaviour of the surrounding residents.

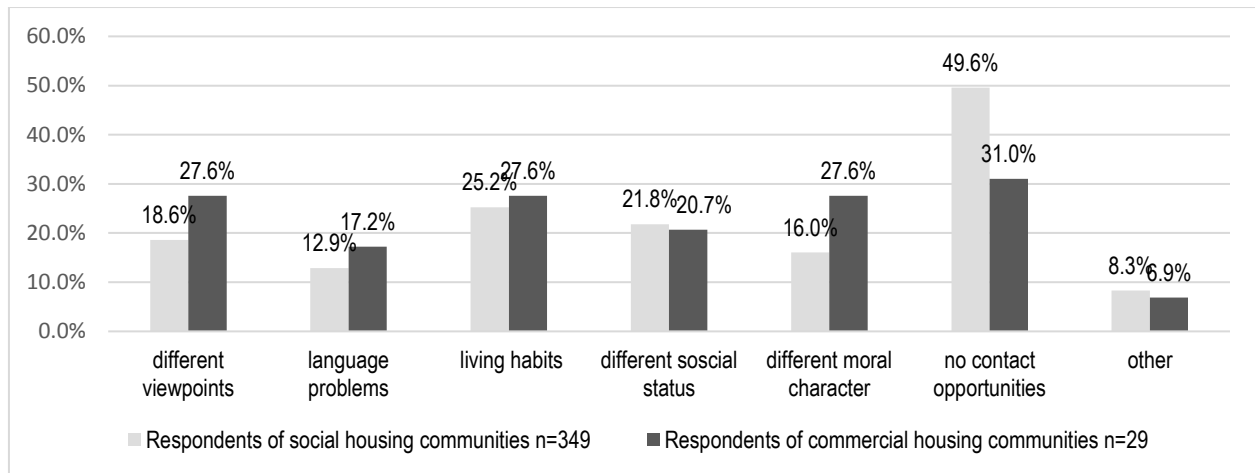
**Difficulties in interactions.** Nearly half of the respondents in both groups confirmed difficulties in communicating with residents in peripheral commercial/social housing communities (see Tab.11.25). Our survey also investigated possible reasons for this. Respondents were allowed to select at most three communication difficulties according to his/her own situation. By comparing the results of the respondents in the two groups, we can identify obstacles to communication, and also find out whether the difficulties the two groups of respondents are confronted with are the same or not.

Drawing from the results in Fig.11.9, good communication on the part of surveyed residents in commercial housing community is largely related to social identity, personality and lifestyle of the target people. However, respondents in social housing place less emphasis on the difficulties in regard to different personal features and highlight the lack of objective opportunities. The reasons given by both groups are language problems, lifestyle and different social status.

However, other reasons given by the two groups are differed: 27.6% of respondents of commercial housing attributed difficulties to different viewpoints and moral characters, while those in social housing communities show lower percentages on these two reason 18.6% and 16.0% respectively. In contrast, respondents in social housing demonstrate distant higher selectivity (49.6%) on the reason “no contact opportunity” than the 31.0% selectivity of people in neighbouring commercial housing. In addition, nearly the same percentage of respondents in neighbouring communities selected different viewpoint, lifestyle, social status, moral character and no contact opportunity. An even selectivity indicates the similar importance of these factors. From the side of surveyed people in neighbouring communities, differences in individual status, viewpoint and personality would influence their communications. And for respondents in social housing, no contact opportunity would appear to be the main obstacle, while other factors are secondary.

**Communication with relatives in peripheral communities.** In addition to investigating daily interactions between two kinds of communities, our survey also studies changes in contacting relatives who live in neighbouring communities after the resettlement of social housing residents. Due to the shortened distance between their homes, a high occurrence of decreasing contact may imply the possibility of segregation after moving into a social housing community.

The result indicates that resettling in social housing has some positive effects for residents in interactions with their relatives in peripheral commercial housing communities. As shown in Tab.11.26, 42.9% and 42.1% of respondents respectively, think their communication with relatives has increased after moving into social housing. With respect to the main reason for this change, the two groups of respondents both pointed to the shortened distance between their homes. The percentages of respondents who confirmed this reason are 37.6% and 42.1% respectively. The overwhelming response means the proximity of homes produces positive effects on interactions between relatives. Nevertheless, 23.1% of respondents in social housing and 10.5% of respondents in commercial housing maintained that connections with relatives had decreased. Differences in community identity, viewpoints and even management within the residential community play a role in the change in communication. Although these percentages are much lower than those for the category of “increased”, they still indicate that moving into social housing may lead to a recognition of differences in identity and viewpoint for a small number of people. Particularly for people in social housing, these difference may cause some obstacles to contacting their relatives in peripheral communities.



**Fig. 11.9 Difficulties in communicating with residents in peripheral commercial/social housing communities**

Source: own draft, 2017. Data source: Total 378 questionnaires: 1) 349 questionnaires (respond “Yes” in Question F10) administered in 13 social housing communities of Guangzhou (n = 660), Question F11-F13 (see in Appendices A.2). 2) 29 questionnaires (respond “Yes” in Question F10) in three neighbouring communities of Fanghe, Jinshazhou and Jude (n = 60). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.



**Tab. 11.26 Communication with your relatives who live in peripheral commercial/social housing communities**

		Respondents of social housing communities (n=338)		Respondents of commercial housing communities (n=19)	
		abs.		abs.	
You ask them for helps after moving in	never	132	39.1	11	57.9
	occasionally	181	53.6	7	36.8
	often	25	7.4	1	5.3
The change of communications between you and relatives after moving in	substantially decreased	8	2.4	0	0.0
	decreased	78	23.1	2	10.5
	no change	99	29.3	9	47.4
	increased	145	42.9	8	42.1
	substantially increased	8	2.4	0	0.0
The reason for the change in communications	change in the distance between the housing	127	37.6	8	42.1
	difference in community identity	31	9.2	1	5.3
	change of viewpoints	46	13.6	2	10.5
	difference in district management	29	8.6	1	5.3
	district environmental hygiene	29	8.6	0	0.0
	district security	16	4.7	0	0.0
	other	39	11.5	3	15.8
<b>Subtotal</b>		<b>338</b>	<b>100.0</b>	<b>19</b>	<b>100.0</b>

Source: own draft, 2017. Data source: Total 357 questionnaires: 1) 338 questionnaires (respond "Yes" in Question F14) administered in 13 social housing communities of Guangzhou (n = 660), Question F15, F16 & F17-F19 (see in Appendices A.2). 2) 19 questionnaires (respond "Yes" in Question F14) in three neighbour communities of Fanghe, Jinshazhou and Jude (n = 60). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

## 11.2 Psychological integration

Psychological integration is a concept that describes individuals' liking or disliking for residents belonging to the community as well as its characteristics. The measurement of psychological integration is mainly generated by a sense of community, and this study additionally incorporates another three concepts: social cohesion/trust, social climate and residential satisfaction. The study of a sense of community examines individual identification which entails two elements: perceptions of the community and emotional exchanges when interacting with neighbours. Social cohesion/trust means the psychological confirmation or acceptance of neighbours. Social climate refers to the perceived security of the community and residential satisfaction means the individual's assessment of the living conditions.

In the questionnaire survey conducted in 13 social housing communities in Guangzhou, the 660 respondents were asked about their perceptions of the actual community and their relationships within the community. Therefore, a frequency analysis on these questions can provide an overview of the general situation. Additionally, our study also cross tabulated these questions to presumed factors (i.e. location, scale of community, construction time, mixed dwelling type, age, gender, educational level, income level, and family type). We attempted to identify the possible effects by comparing the differences between the subcategories of these factors.

### 11.2.1 Sense of community

Sense of community contains connotations of membership, influence, integration and fulfilment of needs, and shared emotional connection (McMillan and Chavis, 1986). Firstly, influence and shared emotional connection point to an interaction between two persons through which needs, values, opinions and emotional benefits are shared. Therefore, this study has defined these interactions as reciprocal exchanges within communities. By examining mutual caring, conflicts and solutions within the community, we have a look at the intimacy and dependence of residents on other people. Then, both of membership and fulfilment of needs refer to an individual's feelings of being a part of community and being together. Our study inquired account personal acceptance in the residential community to reflect residents' psychological perceptions.

### 11.2.1.1 Reciprocal exchange within communities

Reciprocal exchange can directly indicate the degree of intimacy and trust between neighbours. Generally, the questions on this concept concern the favours neighbours do for each other, like caring for neighbours' properties when they are away, and the giving of advice. According to the survey results, the reciprocal exchange is explained mainly by two aspects: mutual care and main conflicts (see Tab.11.27). When the mutual care points towards intimacy among neighbours, conflict and accordingly solutions can reflect obstacles in interaction.

Based on the survey results, residents of social housing communities appear to have good relationships. The majority of people included interacted harmoniously and communicated well with each other in daily life: 55.0% of respondents felt that they live in harmony with their neighbours, and 34.2% of them felt the interaction was quite good and they could solve common problems together. By contrast, people who responded with a very negative attitude only comprised 0.6% and 4.7%. The facts demonstrate very positive personal interactions within communities.

Then, we turn to the main conflicts in daily living within the social housing communities. The main conflicts within social housing communities are relating to personal habits such as hygiene and noise. The most used methods to deal with them are to self-adjust, as well as help from the agencies that are responsible for management and maintenance of buildings within the community. As shown in Tab.11.27, the most common problem reflected is the habit of keeping pets: 38.0% of the 660 surveyed people thought this would cause conflict to their communications with neighbours. The following three problems have comparable severity for the surveyed people: 31.5% of people confirmed conflict related to different hygiene habits, 30.2% of respondents considered different moral characters would be a problem and 28.8% referred to noise problems caused by different working and resting hours. With respect to the main solutions, 46.4% respondents would like to adjust by themselves and 31.7% of them might ask for help from the property company.

**Tab. 11.27 Perceptions about mutual care, conflict and solutions between neighbours in the community**

		abs.	%
The mutual care	very bad	4	0.6
	bad, people are indifferent	31	4.7
	so-so, we get along harmoniously, but don't have frequent contact	363	55.0
	quite good, we solve common problems together	226	34.2
	very good, we help each other	36	5.5
	Total	660	100.0
The main conflicts	different work and resting time, noise problems	190	28.8
	different hygiene habits	208	31.5
	keeping pets	251	38.0
	occupying public space for private use	70	10.6
	parking lot	15	2.3
	different viewpoint	84	12.7
	different moral characters	199	30.2
	other	137	20.8
The solution to conflicts	settle by leaving it unsettled	117	17.7
	both parties adjust themselves	306	46.4
	look for other residents to help	55	8.3
	look for the property company to help	209	31.7
	ask the neighbourhood committee to mediate	137	20.8
	go to the municipal level to explain the situation	11	1.7
	tell the media	8	1.2
	other	118	17.9

Source: own draft, 2017. Data source: Questionnaires constructed in 13 social housing communities in Guangzhou (n = 660), Question D17, D18-D20, and D21-D23 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

### 11.2.1.2 Individual perception with the community: belonging and acceptance

This section is about individuals' identification with a community identity. It includes identifying as part of a community (belonging), shared values, and acceptance of the community, which is commonly explained as the willingness to live in the community long term. Because no direct questions were asked about feelings of belonging and shared values,

we make use of the frequency of contacting new friends within the community and the mode of knowing neighbours to reflect how a person recognizes their neighbours. Because same values, perspectives and habits are assumed as factors that are positively linked to personal contact behaviour, it makes sense to assume that high recognition of common values is shown by the closer connections of surveyed people. Then, we turn to psychological acceptance of living in the social housing community. People were directly asked about their willingness to live long term in the current community. In order to discover the potential factors that may result in different levels of psychological acceptance, the study cross tabulated the answer with nine presumed factors (i.e. location, scale of community, construction time, mixed dwelling type, age, gender, educational level, income level and family type).

**Tab. 11.28 The frequency of contacting new friends within residential community**

	abs.	%
less than once a month	39	6.2
2-3 times a month	61	9.7
once a week	90	14.3
2-3 times a week	166	26.3
every day	275	43.6
<b>Total</b>	<b>631</b>	<b>100.0</b>

Source: own draft, 2017. Data source: 631 questionnaires (according to responded answer in Question D12, omits 29 questionnaires with answer "None") administered in 13 social housing communities in Guangzhou (n = 660), Question D13 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Tab. 11.29 The mode of knowing new neighbours**

	abs.	%
shopping	76	11.5
children's education	98	14.8
public community activities	446	67.6
online community discussions	19	2.9
friends' introduction	93	14.1
other	128	19.4

Source: own draft, 2017. Data source: Questionnaires constructed in 13 social housing communities in Guangzhou (n = 660), Question D14-D16 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

Firstly, we find the public activity in community is a significant way to promote personal relationships with other members of the living environment. And the newly developed relationships were highly recognized. As shown in Tab.11.29, 67.6% of surveyed people knew their new neighbours through participating public activities within community. The fact powerfully underscores that the residential community itself plays an important role in the personal interactions of residents. At the same time, contact frequency stays at high level that 43.6% of respondents have daily communication, 26.3% keep contact 2-3 times per week and 14.3% have once contact per week (see Tab.11.28).

Secondly, classified statistics have shown the different levels of acceptance between surveyed people of various characteristics (see Tab.11.30). As a whole, residents in social housing communities are very willing to live in the current community. Surveyed people who confirmed acceptance of the community reached 86.7%. Communities in different locations, and of different scales, construction times, and mixed types demonstrate separate results regarding long-term residence, and the personal characteristics of age, education, income and family type also lead to different levels of acceptance. Compared to surveyed people in the western and northern clusters, those in the middle (Haizhu district) and eastern clusters (Tianhe district) demonstrated distinct gaps in willingness to live in social housing long term. The percentages of positive answers are high – 99.3% and 88.8% – in the western and northern clusters, while these percentages are only 76.0% and 78.8% in the middle and eastern clusters. This means the willingness of respondents who are located in the middle and eastern communities is not as strong as those in the western and northern social housing communities, who would be more likely to live in the current environment. Similarly, the surveyed people in communities that are medium scale, fully mixed, and have a longer development time from 1998, demonstrate certain gaps as opposed to other types (see Tab.11.30). That is to say, in communities with a population over 4000 (big scale

community) or below 1500 (small scale community), and in communities that were constructed after 2008 and in those with a half-mixed or non-mixed dwelling mode, residents are more likely to show willingness to live there long term.

**Tab. 11.30 Willingness to live in social housing long term**

Factors		Willingness of long-term living					
		no		yes		Total	
		abs.	%	abs.	%	abs.	%
<b>Location</b>	western cluster: Liwan district	1	0.7	139	99.3	140	100.0
	middle cluster: Haizhu district	24	24.0	76	76.0	100	100.0
	eastern cluster: Tianhe district	34	21.3	126	78.8	160	100.0
	northern cluster: Baiyun district	29	11.2	231	88.8	260	100.0
<b>Constructed time</b>	developed from 1998	60	18.8	259	81.2	319	100.0
	2008-2010	25	8.9	256	91.1	281	100.0
	after 2010	3	5.0	57	95.0	60	100.0
<b>Scale</b>	big scale (>4000)	23	7.2	296	92.8	319	100.0
	median scale (1500-3000)	58	24.2	182	75.8	240	100.0
	small scale (<1500)	7	6.9	94	93.1	101	100.0
<b>Mixed type</b>	fully mixed: Low-rent housing, Affordable housing & ANJU housing	60	18.8	259	81.2	319	100.0
	half-mixed: Low-rent housing & Affordable housing	24	9.2	236	90.8	260	100.0
	non-mixed: Affordable housing	4	4.9	77	95.1	81	100.0
<b>Age</b>	<20	3	75.0	1	25.0	4	100.0
	20-29	19	35.8	34	64.2	53	100.0
	30-39	21	21.9	75	78.1	96	100.0
	40-49	15	13.8	94	86.2	109	100.0
	50-59	22	8.5	237	91.5	259	100.0
	>=60	7	5.6	118	94.4	125	100.0
<b>Gender</b>	male	32	12.7	220	87.3	252	100.0
	female	56	13.7	352	86.3	408	100.0
<b>Educational level</b>	no education	0	0.0	15	100.0	15	100.0
	primary school	7	9.1	70	90.9	77	100.0
	middle school	18	8.1	205	91.9	223	100.0
	high school or technical secondary school	37	13.9	229	86.1	266	100.0
	undergraduate study or junior college	26	33.3	52	66.7	78	100.0
	other	0	0.0	1	100.0	1	100.0
<b>Income level</b>	<500yuan	0	0.0	25	100.0	25	100.0
	500-999yuan	4	9.8	37	90.2	41	100.0
	1000-1999yuan	11	10.2	97	89.8	108	100.0
	2000-2999yuan	10	10.5	85	89.5	95	100.0
	3000-3999yuan	8	7.9	93	92.1	101	100.0
	4000-4999yuan	16	17.8	74	82.2	90	100.0
	5000-5999yuan	13	18.3	58	81.7	71	100.0
	6000-6999yuan	13	23.6	42	76.4	55	100.0
>7000yuan	13	17.6	61	82.4	74	100.0	
<b>Family type</b>	low-income family	12	8.2	135	91.8	147	100.0
	low insurance household	0	0.0	66	100.0	66	100.0
	poor household	0	0.0	6	100.0	6	100.0
	widowed, elderly, disabled, veteran's relatives etc. special families	3	12.0	22	88.0	25	100.0
	common family	69	17.2	333	82.8	402	100.0
	other	4	28.6	10	71.4	14	100.0
<b>Total</b>		<b>88</b>	<b>13.3</b>	<b>572</b>	<b>86.7</b>	<b>660</b>	<b>100.0</b>

Source: own draft, 2017. Data source: Questionnaires constructed in 13 social housing communities in Guangzhou (n = 660), Question H49 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

Aside from the effects of the condition of the community, personal characteristics such as age and education also lead to a disparity in aspirations for long-term residence. As shown in Tab.11.30, the following groups of people do not demonstrate as much willingness: people younger than 40 years old; people with higher education, particularly those

with undergraduate study; people with a monthly income of over 4000 yuan, and people in common households. The noticeable differences among these groups may indicate that age (40 years old), educational level (undergraduate study), income level (4000 yuan) and common household identity are the cut-off points of acceptance of long-term residence. Surveyed people who are younger and more educated and who have a higher income are less willing to live in social housing long term. The willingness to reside long term will decrease as income and education increase, and will increase with age.

### 11.2.2 Social cohesion/social trust

Social cohesion/social trust refers to a feeling of being trusted and being treated politely in an individuals' social behaviour. As to the social cohesion of residents in social housing communities, we attempted to demonstrate their psychological identification by way of inquiring about acceptable/aspirational relationships with inhabitants in the neighbourhood. According to the varying degrees of intimacy, the survey separately investigated the strength of willingness to develop the stated relationships. Willingness to be close friends indicates a high degree of trust in nearby people. Subsequently, social trust among friends, neighbours, colleagues decreases. Keeping one's distance and having no contact mean personally refusing to engage in relationships that involve people. If a high weight of respondents answered that they are (very) willing to have no contact, it may imply weak aspirations of social housing residents to integrate into the local environment, and that their trust in their neighbours is at a low level.

**Tab. 11.31 Personal willingness to develop relationships with residents of surrounding communities, from 660 respondents in social housing communities**

	unimaginable		unwilling		no idea		willing		very willing		Total	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
close friends	12	1.8	46	7.0	199	30.2	355	53.8	48	7.3	660	100.0
friends	1.8	0.8	30	4.5	180	27.3	389	58.9	56	8.5	660	100.0
neighbours	5	2.0	24	3.6	181	27.4	386	58.5	56	8.5	660	100.0
colleagues	0.8	3.2	25	3.8	234	35.5	340	51.5	40	6.1	660	100.0
keep distance	13	6.4	158	23.9	312	47.3	138	20.9	10	1.5	660	100.0
no contact	2	22.9	245	37.1	185	28.0	71	10.8	8	1.2	660	100.0

Source: own draft, 2017. Data source: Questionnaires constructed in 13 social housing communities of Guangzhou (n = 660), Question G3-G8 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

**Tab. 11.32 Personal willingness to develop relationships with residents of surrounding communities, from 60 respondents in three peripheral commercial housing communities**

	unimaginable		unwilling		no idea		willing		very willing		Total	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
close friends	1	1.7	7	11.7	24	40.0	28	46.7	0	0.0	60	100.0
friends	0	0.0	2	3.3	21	35.0	37	61.7	0	0.0	60	100.0
neighbours	1	1.7	3	5.0	24	40.0	32	53.3	0	0.0	60	100.0
colleagues	1	1.7	3	5.0	25	41.7	30	50.0	1	1.7	60	100.0
keep distance	3	5.0	19	31.7	31	51.7	6	10.0	1	1.7	60	100.0
no contact	9	15.0	30	50.0	20	33.3	1	1.7	0	0.0	60	100.0

Source: own draft, 2017. Data source: Questionnaires constructed in 3 neighbouring communities of Fanghe, Jinshazhou and Jude (n = 60). Question G3-G8 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013.

Residents of social housing communities and residents of the peripheral commercial housing communities demonstrated a parallel and positive willingness to develop common relationships with the other party. As seen from Tab.11.31 and Tab.11.32, both groups possess a majority of respondents who replied with positive willingness to engage in relationships with close friends, friends, neighbours and colleagues. Overall, less than 10% of respondents in each group displayed a negative attitude in terms of finding such relationships unimaginable and being unwilling to

engage. Nevertheless, regarding keeping their distance from the other group of people, both sides demonstrated an increased unwillingness and reduced eagerness.

Respectively, a high percentage, namely 23.9% and 31.7%, of respondents in the two groups displayed an unwilling attitude to this distant relationship, and the weights of “willing” dropped to 20.9% and 10.0%. Seen from the greatly growing proportions of the answers “unimaginable” and “unwilling” in the form of no contact, this attitude to the distant relationship goes even further. Therefore, the results may indicate that residents of social housing communities possess similarly strong aspirations to those of commercial housing communities in terms of having normal interactions with nearby people, regardless of differences in identity or living environment. It is not negligible that some differences exist between two groups. Social housing residents seem equally keen on any type of normal relationship like friends and neighbours, but residents of commercial housing communities prefer a common relationship and are less enthusiastic about being very close friends. To conclude, social housing residents have a positive attitude to integrating into the local environment, and it is highly possible that they will be accepted and incorporated by the surrounding people.

#### 11.2.4 Social climate

Examining the social climate focuses mainly on the fear of crime, community problems and informal social control. Our survey asked every respondent about any experiences of unsafe situations in the past year. A total of five were listed: have been beaten up, have been cheated out of property, having had goods stolen, have been threatened and have been robbed. In terms of responses, the social climate of the 13 surveyed social housing communities are seems acceptable. But property security appears not to be as good as personal security. As shown in Tab.11.33, 1.1%, 1.5% and 1.2% of respondents respectively have experienced incidents of being beaten up, being threatened and being robbed. However, more people have suffered loss of property, 8.6% of them encountered thievery and 3.9% experienced cases of cheating.

**Tab. 11.33 Experiences in the past year**

	be beat up		be cheated of property		be stolen		be threatened		be rubbed	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
<b>no</b>	653	98.9	634	96.1	603	91.4	650	98.5	652	98.8
<b>yes</b>	7	1.1	26	3.9	57	8.6	10	1.5	8	1.2
<b>Total</b>	660	100.0	660	100.0	660	100.0	660	100.0	660	100.0

Source: own draft, 2017. Data source: Questionnaires constructed in 13 social housing communities of Guangzhou (n = 660), Question E18-E22 (see in Appendices A.2). Surveyed by Chao. R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

#### 11.2.3 Residential satisfaction

Residential satisfaction refers to personal evaluation of given items according to residents' psychological feelings that their needs have been satisfied. Our inquiry may directly reflect results regarding satisfaction with aspects of housing design, community environment, community management, public services, neighbours' behaviour and potential work opportunities. The degree of satisfaction has been scaled into five categories from very dissatisfied to very satisfied (see Tab.11.34). Because these questions are designed in five-Likert scale, our study focuses mainly on comparing the percentages of positive answers and negative answers. In total, over 70% of respondents responded with satisfied and very satisfied; we define this as a high level of satisfaction with the service. When a service has over 50% of respondents with positive answers and has a weight of negative answers of less than 10%, it can be regarded as having met a level of basic satisfaction. In addition, below 50% satisfaction and around 10% dissatisfaction means it is relatively a bit harder to meet people's needs, and when the weight of negative answers is over 20%, we consider this to indicate a dissatisfied attitude among respondents.

Generally speaking, the surveyed people in social housing communities are quite satisfied with the housing design, particularly the ventilation, lighting and basic conditions. However, building quality does not seem to be to their satisfaction. To compare, only 35.9% of people considered housing quality satisfactory, and 7.4% replied with the answer “very satisfied”, while a total of 17.9% of people were dissatisfied, and a high 6.5% of respondents replied that they were very dissatisfied. Therefore, except for housing quality, other aspects of the design of dwellings in social housing communities meet the expectations of surveyed residents.

Tab. 11.34 Residential satisfaction

		very dissatisfied		dissatisfied		so-so		satisfied		very satisfied		Total	
		abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Housing design	Indoor ventilation	5	0.8	26	3.9	104	15.8	367	55.6	158	23.9	660	100.0
	Indoor lighting	5	0.8	27	4.1	102	15.5	368	55.8	158	23.9	660	100.0
	Corridor space	5	0.8	35	5.3	149	22.6	346	52.4	125	18.9	660	100.0
	Quietness of environment	18	2.7	80	12.1	189	28.6	278	42.1	95	14.4	660	100.0
	Building quality	43	6.5	75	11.4	256	38.8	237	35.9	49	7.4	660	100.0
	Housing space	11	1.7	83	12.6	227	34.4	289	43.8	50	7.6	660	100.0
	Housing design	14	2.1	65	9.8	212	32.1	306	46.4	63	9.5	660	100.0
Facilities within community	Street lighting	17	2.6	61	9.2	190	28.8	337	51.1	55	8.3	660	100.0
	Public space within the community (e.g. Green space, fitness machines)	8	1.2	63	9.5	222	33.6	286	43.3	81	12.3	660	100.0
Community management	Property management	31	4.7	72	10.9	283	42.9	241	36.5	33	5.0	660	100.0
	Public service in the community	20	3.0	79	12.0	290	43.9	232	35.2	39	5.9	660	100.0
	Security	19	2.9	87	13.2	277	42.0	237	35.9	40	6.1	660	100.0
Services	Schools and nurseries	12	1.8	46	7.0	228	34.5	313	47.4	61	9.2	660	100.0
	Medical facility	35	5.3	111	16.8	230	34.8	245	37.1	39	5.9	660	100.0
	Shopping facilities	23	3.5	76	11.5	209	31.7	295	44.7	57	8.6	660	100.0
Social integration	Neighbourhood relations in the community	3	0.5	15	2.3	233	35.3	345	52.3	64	9.7	660	100.0
	Integration with surrounding communities	9	1.4	43	6.5	375	56.8	208	31.5	25	3.8	660	100.0
Potential opportunity	Work opportunities in the vicinity	32	4.8	153	23.2	319	48.3	140	21.2	16	2.4	660	100.0
<b>Overall evaluation on the community</b>		<b>3</b>	<b>0.5</b>	<b>10</b>	<b>1.5</b>	<b>286</b>	<b>43.3</b>	<b>327</b>	<b>49.5</b>	<b>34</b>	<b>5.2</b>	<b>660</b>	<b>100.0</b>

Source: own draft, 2017. Data source: Questionnaires constructed in 13 social housing communities in Guangzhou (n = 660), Question H1-H19 (see in Appendices A.2). Surveyed by Chao, R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

Tab. 11.35 Five priority factors when choosing an ideal community

	First factor		Second factor		Third factor		Fourth factor		Fifth factor	
	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Location is near to the city	152	23.0	49	7.4	32	4.8	23	3.5	30	4.5
Convenient to go to work	88	13.3	69	10.5	34	5.2	19	2.9	10	1.5
Convenient transportation	245	37.1	174	26.4	63	9.5	38	5.8	11	1.7
Surrounding public service facilities are sufficient	36	5.5	96	14.5	129	19.5	89	13.5	61	9.2
Good district property management	17	2.6	27	4.1	41	6.2	48	7.3	34	5.2
Abundant education resources	16	2.4	60	9.1	58	8.8	41	6.2	29	4.4
Sufficient medical facilities	17	2.6	52	7.9	81	12.3	76	11.5	48	7.3
Good commercial environment	2	0.3	11	1.7	23	3.5	32	4.8	42	6.4
Enough work opportunities	2	0.3	3	0.5	8	1.2	15	2.3	16	2.4
Good housing quality	26	3.9	35	5.3	48	7.3	64	9.7	53	8.0
Appropriate price of water and gas	10	1.5	29	4.4	52	7.9	46	7.0	51	7.7
Sufficient green areas in the district	22	3.3	19	2.9	28	4.2	70	10.6	89	13.5
Sufficient space for public activities within the district	4	0.6	14	2.1	15	2.3	31	4.7	57	8.6
Ratio between low-rent housing and economic social housing	2	0.3	1	0.2	11	1.7	5	0.8	12	1.8
Spatial arrangement between different types of social housing	3	0.5	3	0.5	7	1.1	9	1.4	19	2.9
Other	16	2.4	2	0.3	2	0.3	3	0.5	7	1.1
<b>Total</b>	<b>658</b>		<b>644</b>		<b>632</b>		<b>609</b>		<b>569</b>	

Note: 2 cases are missing.

Source: own draft, 2017. Data source: Questionnaires constructed in 13 social housing communities in Guangzhou (n = 660), Question H44-H48 (see in Appendices A.2). Surveyed by Chao, R, with the support of Sun Yat-sen University, Department of geography and urban planning, Sep. 2013 and Sep. 2014.

With respect to personal satisfaction with neighbourhood integration, the situation in the social housing community is much more positive than the results of neighbouring commercial housing. A total of 62.0% of people responded that they were satisfied and very satisfied with neighbourly relations within the community, while 56.8% chose “so-so” and only 35.3% were satisfied with relations with surrounding communities.

The majority of basic facilities provided for social housing communities (e.g. street lighting, inner public spaces, schools and nurseries and shops) were regarded as satisfactory by surveyed residents. In terms of the results in Tab.11.34, each of these facilities has over 50.0% of people who are very satisfied and satisfied, and around 10% of people who are very dissatisfied and dissatisfied. The exception is medical facilities, the level of satisfaction with which is defined as dissatisfactory, because of over 20% in negative answers and less than 50% satisfaction. In addition, 5.3% of people were very dissatisfied and 16.8% people were dissatisfied. And the ratios of the categories “satisfied” and “very satisfied” are 37.1% and 5.9% respectively.

Nevertheless, people’s evaluation of the management within the community, which entails property management, public services and maintenance of security was that it is not satisfactory. Only approximately 40% of people felt satisfied with these services, and nearly 15% of people were dissatisfied. A very severe assessment is noticeable from the surveyed people about work opportunities in the vicinity. While 4.8% and 23.2% of people opted for the answers “very dissatisfied” and “dissatisfied” respectively, only 23.6% held a positive attitude (21.2% in the answer “satisfied”, 2.4% in “very satisfied”). The results indicate that work opportunities in the areas surrounding social housing do not meet the psychological expectations of surveyed residents. Compared to the provision of most physical facilities, conditions pertaining to management, medical services and work opportunities need to be improved to some extent.

In terms of importance, when describing their ideal community, surveyed people could mark five factors at most. Based on the results in Tab.11.35, the top-most factor is convenient transportation. Transport has overwhelming significance for surveyed people, with 37.1% of people choosing it as the most important factor and 26.4% of people placing it in second position. Secondary factors include location close to the city, convenience in getting to the workplace and sufficient public facilities in the surrounding area. As seen from the details in Tab.11.35, the proximity of housing to the city centre was selected as the most important factor by 23.0% of respondents. In addition, 13.3% of respondents listed the factor of convenience in getting to work at the first place, and 10.5% of respondents ranked this factor in second place. As to the provision of public facilities, 14.5%, 19.5% and 13.5% of respondents respectively placed it in second, third and fourth position. Then comes the provision of education resources and medical services in the residential area, followed by some others like sufficient green areas in the district, housing quality and appropriate price of water and gas.

In summary, in judging the standard of a community, people in social housing communities may prioritize the convenience of going out. They prefer to live in a community with favourable transportation. In addition, basic needs such as convenience in getting to work, a good location and sufficient public services were strongly emphasized. After fulfilling these requirements, people may look for good education and health services, and the conditions (e.g. green area, price of water and gas) that are linked to better living experiences.

### 11.3 Conclusion

This chapter focused on two main purposes: to examine the situation relating to neighbourhood integration in social housing communities and to ascertain the issues that may contribute to the degree of integration. Analysis began with two dimensions: social integration and psychological integration. Both dimensions entail several secondary topics and corresponding indicators. In terms of the research structure and questions designed (see Tab.10.1), our study separately analysed social participation, social communication, sense of community, social cohesion/trust, social climate and residential satisfaction. The following section will summarize all results to give a brief summary of the facts regarding the integration and related effects (see Tab.11.36).

**Social participation.** In accordance with the findings on political participation in section 11.1.1.1 and sociocultural participation in 11.1.1.2, residents in social housing communities may be very interested in joining political organizations



which are functioning at community level and closely related to daily life, but they seem to rarely join in sociocultural activities except outdoor leisure activities. Firstly, the most participated in political activities include those held by the property company, the district neighbourhood committee and the district street office. As to connections with organizations functioning at city level, residents demonstrated much less interest. Nevertheless, nearly 80% of respondents get in touch less with the owner committee, the police station and the media, which implies that social housing residents rarely utilize their public power or owners' rights. In addition, over 70% of people responded that they never or seldom participated in sociocultural activities relating to elections in the community, cultural activities at the community centre, recreational activities, volunteering, spontaneous donations and discussions. However, only 35.1% of people answered they never or seldom joined in outdoor leisure activities, and 23.5% often joined in very often, while 13.5% of respondents joined in every time.

In addition to the general situation, our analysis separately examined the effects of various personal characteristics and dwelling features (i.e. age, gender, education, income level, family type, location of community, construction time, scale and mixed dwelling type). By cross tabulating the factor to the participating behaviours (see Tab.11.3-Tab.11.21), we identified the significant factors and their effects on the social participation of people in social housing. At first, the length of residence, scale, education, and special status may contribute to political participation, while income level has negative effects. Although overall participation in most sociocultural activities (except outdoor leisure) is quite low, the length of residence, age, education and income level improve participation to some extent. It should be noted that the link between income and participative behaviour is apparently positive among people with a monthly income of below 4000 yuan. At the same time, the scale and the mixed dwelling type also have a weakly positive influence. However, households with limited economic ability show less participation in most activities except for outdoor leisure.

To summarize, people in communities that were built earlier or are large and of a mixed dwelling mode, may have more participants involves in activities of a political and sociocultural nature. In other words, the longer the length of residence and the larger the number of neighbours, the more opportunities there are for communication between various people, and this may increase the number of people involved in activities. Simultaneously, higher levels of education and higher income levels also have a positive effect on individuals' presence in many activities both social and cultural. Additional to the above effects of community features and personal characteristics, political participation has a special relationship with the status of the household. People from families with lower economic ability, such as low-income families and low insurance families, have more contact with administrative organizations than people from common families.

**Social communication.** Drawing from the discussion on the daily contact of surveyed people within/outside their residential neighbourhoods, residents in social housing communities have successfully established their own social networks within the residential community rather than outside. The new friends in the community play an essential role in their social networks. The supporting data is that over 80% of the 660 respondents had more than five friends, and over 60% had more than 10 friends after resettling indicates that respondents' new social networks within the social housing communities have been well built up. As the number of new friends demonstrates, it is reasonable to assume that the group of new friends constitutes the main part in an individual's social network within the community. However, contact between people in social housing and people in neighbouring communities occurs much more seldom. A high percentage of 36.2% of people had not made any friends in the peripheral community and 50.0% of respondents in social housing never visited neighbouring communities. Interaction between the two groups is not frequent, but in comparison, the surrounding residents in commercial housing communities show greater activity in interacting than social housing residents.

To conclude the connections with ten kinds of people, which are classified by their personal characteristics and their living environment, residents of social housing communities prefer to have intimate contact with people who are spatially close to them. The shorter the distance between them, the higher the contact frequency. Furthermore, the social status and personal hobbies of neighbours may also have an influence on residents' interactions. No matter whether geographically near or far, respondents show much greater intimacy with the old Guangzhou residents than with the new Guangzhou residents. Surveyed people also appear to have better connections with those who like community cultural activities. Apart from the effects of various neighbours, the residential conditions (e.g. location, scale and dwelling type) and personal characteristics like age, gender, education, income, also resulted in different behaviours

among social housing residents. Firstly, residents of the western communities have more communication with various people and their social contacts appear to be more numerous and frequent. Similarly, communities in both large size (population over 4000) and small size (population size less than 1500) communities, and a half-mixed communities (which have separated LRH and EAH by buildings or inner spatial barriers), have a greater weight of residents who have developed multiple social contacts which are not limited by the borders of the community. People in fully-mixed communities and those in middle-size communities, appear to have much more intimate relationships with neighbours in a same community. However, their contact with people who live in other communities or who have different social identities is much less. That is to say, middle-size communities designed with fully-mixed dwelling types may increase inner contact but may result in reduced interactions with other citizens to some extent. Secondly, female residents, people aged over 40 years old and less educated people (particularly those who have no education) show greater dependence on the internal social environment of the community. Furthermore, a high income level may positively affect personal contact with neighbours.

**Sense of community.** This study classified the meaning of sense of community into two aspects: reciprocal exchange and individual identification with the community. Examination of reciprocal exchange is regarding the mutual caring, conflict and accompanying solutions between people within communities. It can directly reflect the degree of intimacy and trust within the residential community. Based on the survey results, the majority of residents have good relationships with other people within their social housing communities. They can interact harmoniously and communicate well in daily life: 55.0% of respondents found that they could get along with neighbours in harmony, and 34.2% felt that interaction was quite good and that they were able to solve common problems together. Nearly one-third of respondents reflected that they confronted hygiene and noise problems and issues caused by the poor moral character in neighbourly relations. Half of them would like to deal them by themselves and 31.7% of them asked for help from the local property company.

Individual identification with the community is mainly about the feeling of being a member of a community (belonging), and the willingness to live there long term (acceptance). The public activities in communities can strengthen personal identification with the residential community. As these activities greatly improve personal interactions, newly developed relationships are highly accepted. Nine out of ten respondents have a minimum of contact once per week. Nevertheless, in accordance with the confirmed acceptance in the community, which reached 86.7%, we find that residents in social housing communities are very willing to live in the current community. Further, some factors may lead to greater acceptance by residents, such as being over 40 years old, having a lower educational background and lower income and households who are confirmed by government because of the low economic ability. The residents with these features not only possess high acceptance of the community, but also demonstrate greater dependence on internal relationships in the community. However, willingness to live in the community long term is much less among the following groups: younger people (less than 40 years old), more educated people (particularly those who have achieved an undergraduate education) and people with higher incomes. The features of the community also lead to different levels of acceptance. Communities located in the western and the northern clusters, and communities developed after 2008, have a higher percentage of residents who are willing to live in social housing long term. However, residents of communities which are designed in middle size and fully mixed dwelling mode responded with lower intentions to long-term living. That is to say, a larger percentage of them would be willing to move into a new residence in the future. Despite being strongly dependent on the current community in daily communications, residents in middle-size or fully mixed communities seem to have lower acceptance of the current community.

**Social cohesion/social trust, social climate and residential satisfaction.** Social cohesion/social trust refers to a feelings of being trusted and being politely treated in terms of social behaviour. According to the varying degrees of intimacy, the survey separately investigated the strength of willingness to develop a relationship. As a result, residents of social housing communities and residents of peripheral commercial housing communities demonstrates a parallel and positive willingness to develop a relationship with the other party. Both groups possess a majority of respondents who replied with positive willingness to develop relationships such as close friends, friends, neighbours and colleagues. The number of people who want to keep their distance and have no contact with the other group is much lower. Social housing residents seem equally keen on any type of normal relationship like friends and neighbours, but residents of commercial housing communities tend to prefer a common relationship and are less enthusiastic about being very close

friends. To conclude, social housing residents have a positive attitude to integrating into the local environment, and it is highly possible that they will be accepted and incorporated by the surrounding people.

Social climate mainly focusses on the fear of crime, community problems and informal social control. In terms of responses to the experiences of unsafe occurrences in the past year, the social climate of the 13 surveyed social housing communities seems to be acceptable. However, property security seems not to be as good as personal security. The analysis of residential satisfaction is relating to examine whether the provision of services meets personal aspirations. The study included satisfaction with housing design, community environment, community management, public services, neighbouring behaviours and potential work opportunities. The surveyed people in social housing communities were quite satisfied with the housing design, particularly the ventilation, lighting and such basic conditions. In addition, the majority of basic facilities that are provided for social housing communities (e.g. street lighting, internal public spaces, schools and nurseries and shops), were regarded as satisfactory by surveyed residents. However, residents do not appear to be satisfied with the building quality, provision of medical facilities and management within communities. People stress the convenience of travelling when choosing an ideal community. They prefer to live in a community with favourable transportation. At the same time, the convenience getting to work, a good location and sufficient public services are also important conditions to reference.

Finally, the above analysis provided a full-scale overview of neighbourhood integration. Generally speaking, residents of social housing communities have adapted to the new environment and have established good social networks. It is noticeable that the majority of people have developed many relationships within the community rather than outside. This phenomenon is more obvious in communities that are middle size and contain fully mixed dwelling types. And people who are older (over 40 years old), less educated and have low economic ability may have increased dependence on the community and be more separated from multiple connections outside. The connection between social housing residents and people who live nearby is much less, although both are willing to develop common relationships with each other. This indicates that no psychological exclusion exists and it is highly possible for social housing residents to integrate into the local environment.

With respect to the positive effect of local government on neighbourhood integration, several principles have been identified. Location projects should take the economic ability of residents into consideration. Low-income housing for low-income households should be closer to the city centre, and economically affordable housing and also public rental housing for households with higher income levels can be placed in peripheral areas where supporting facilities have not been well established (Interview results of Mr. Ye, 2013). The idea of avoiding concentrated residence of low-income families in periphery is to reduce integration as much as possible. The higher economic ability and greater participation in social activities may encourage local development rather than generating concentrations of the poor in remote areas. Furthermore, a half-mixed dwelling mode should be the main type of the community, including both low-income housing and economically affordable housing, but separating them into sections or buildings. Our study has confirmed the advantages of this mixed type over the fully mixed and the single type. The benefits would be the presence of healthy personal relationships both within and outside the community. In addition, the consideration of developing communities in both a large size one with over 4000 people and a small size one with less than 1500 inhabitants, may be more helpful to live in integrated residential units for people with weaker economic abilities.

Tab. 11.36 Influences of the social integration of residents in social housing community

Factor	Features of the community				Personal characteristics				
	Location	Construct time/ the length of residence	Scale	Mixed type	Age	Gender	Education	Income level	Family status
Social participation/ social functioning	<b>Political participation: residents in social housing community may highly interested in joining political organizations which are functioning at community level and closely relate to daily life</b>								
	<p>- Except the middle cluster, no significant differences exist among western cluster, eastern cluster and northern cluster. The contacting frequencies of residents in middle cluster are distinctly lower than people from the other three clusters.</p>	<p>- It has influences on the contacting frequencies. Residents in communities that developed during 2008-2010 have stronger connections with political organizations than communities built in 1998 or built after 2010. - And the long-time development may increase residents' connection with locally based organizations, but not the city-level organization. People from new built communities demonstrate higher contacting frequencies with city-level administrative agencies.</p>	<p>- It positive relates to the contact frequency with the administrative or spontaneous political activities. The larger community is (with more neighbours), the higher possibility of residents may join activities. Surveyed people of the big communities show some advanced positivity than the medium- and the small- communities. - No clear influences onto the contacting with the community-based, daily-needed service organization.</p>	<p>- It has effects on residents' participation behaviour into local political activities. Particularly residents in half-mixed community presents higher level than other mixed types. - In the contacting frequencies with the city-level organizations, group 'single' displays higher weights on positive categories than the group 'fully mixed' is. But in contacting with the locally based political organizations, 'fully mixed' demonstrates higher frequency than the situation of the group of 'single'.</p>	<p>- An insignificant factor</p>	<p>- No significant influence. The male group and the female group demonstrate an equivalent contact frequency with all organizations.</p>	<p>- It positively influences the contacting with all listed organizations (i.e. administrative agencies, local service organizations, media). The more educated people is, the higher contacting frequencies are. Particularly middle school educated people demonstrates the closest connections. Less educated people who only attained primary study or never, seems much less performing in those political activities.</p>	<p>- It negatively influences the contacting with administrative agencies. The people with higher income may less contact these organizations than the people with lower income. Particularly, lower-income residents are closer to local volunteers' activities than higher-income residents.</p>	<p>- It influences the contacting with administrative organizations. Authorized economic-weak or social-weak families have higher contacting frequencies than the common family</p>
Social participation	<b>Social participation: residents in social housing community have particularly high interests on the outdoor leisure activities, but rarely join any other type of sociocultural activities</b>								
	<p>- Residents in the western cluster have high involvement into sociocultural activities (except the outdoor leisure) than people live in the other three clusters. The participation frequency of people from the middle cluster and the northern cluster show at secondary level, and the situation of eastern cluster is distinct low.</p>	<p>- It has strong influences. The participation of residents in communities that developed after 2010 is largely falling behind these earlier built communities. The participation behaviours of residents in communities '1998' and '2008-2010' have comparable degrees.</p>	<p>- The scale has weakly positive relation with the participation into cultural, recreational, volunteering and donative activities. - Residents in medium scale have lower involvement into the outdoor leisure and spontaneous discussions within community. - No clear effects to the election behaviour.</p>	<p>- It produces a weak effect. People in community with mixed housing types present a bit higher participative degree, and people of the half-mixed one has the top degree participation.</p>	<p>- It has positive effects on participating outdoor leisure activities. Frequency shows a raising progress with the age. - Has influences on people's behaviour in joining the election of the community owner committee, cultural, recreational, volunteering and donative activities. Participation of senior people, particularly over 50 years old, demonstrate a relatively polarized situation, high occurrence of never attending and comparatively high possibility of close connection. More people at younger ages, especially below 40 years old, demonstrate a limited attaching with these activities. - No significant influence on joining the election of the community neighbourhood committee.</p>	<p>- No significant influence. The male group and the female group demonstrate an equivalent participating degree on most activities. Only several activities (cultural exchanging, singing, dancing etc.) may be attractive for female than male in very slight degree.</p>	<p>- It positively affects the participation of elections, cultural, recreational, volunteering, donation and local discussion activities. Less education (e.g. no education, primary school) may cause higher possibility of no connections, and high education (undergraduate study) may obviously contributes to participations. - Negatively relates to participative frequency into the outdoor leisure activities. Less educated person may more appear in this activity than high-educated people may.</p>	<p>- Income level, 4000yuan, is a watershed to distinguish participative behaviour of surveyed residents. - Below 4000yuan, The income has a positive relation with people's participations in joining the election of the community owner committee and the donation. However, no clear relations have been shown with other sociocultural activities. - Over 4000yuan, the participation behaviours into any sociocultural activities may not relate to the income level.</p>	<p>- People from confirmed families with limited economic ability have lower participation in most sociocultural activities (except the outdoor activity) than those from other family types. And no big difference exist among variously titled families in low-income level. - Joining the outdoor leisure activity is less relate to the family type.</p>

Social communication	<p><b>Social communication</b>  <b>Social ties: residents in social housing communities have successfully established their own social networks within the living community. Social interactions with residents in neighbouring community is seldom. The new acquainted friends in community compose the essential part of their social networks</b>  <b>Social contacts: residents of social housing community may have more intimate contacts with people who are spatially near.</b></p> <ul style="list-style-type: none"> <li>- Resident in middle cluster have the most contact with people who are proximate, but they have very less contact with other people</li> <li>- The social contact of residents in western cluster is more multiple and frequent</li> <li>- Residents in eastern cluster have more contacts with new Guangzhou residents</li> <li>- With over 2 years length of living in social housing community, the local personal network can be well established</li> <li>- Residents of middle scale community have less contacts with different people, except those live in a same community. Large size and small size would be helpful to forming a multiple social contacts of residents</li> <li>- Small size communities may lead to more contacts with people in neighbouring community</li> <li>- Fully mixed community is helpful to residents to develop a better inner social contacts, and simultaneously may lead to fewer contacts with people who are geographically outside the living unit.</li> <li>- The half mixed community may has advantages in establishing a multiple social connections for residents</li> <li>- Compared to elder residents over 40 years old, young residents in social housing community may have less dependence on old relationships, and their social contacts may fewer relate to what identity the people is.</li> <li>- The elder the resident is, the more contacts with low-rent housing residents, economic housing residents and people loves cultural activities are.</li> <li>- Female respondents present more frequent contacts with people in the same community.</li> <li>- Male respondents demonstrate a polarization in contacting people in the same building and people who loves local cultural activities</li> <li>- No education or high-level education may have effects on contact frequency of residents</li> <li>- Fewer educated residents have more contacts with very near, very local and vulnerable persons, while higher educated residents have more contacts with new Guangzhou residents</li> <li>- The income may positively relate to the frequency of interaction with neighbours, particularly those in the same building</li> <li>- High-income respondents seems prefer to contact residents who have better economic ability, while low-income respondents show more frequent contacts with people who have lower economic ability</li> <li>- No clear relations</li> </ul>								
Sense of community Acceptance	<p><b>Sense of community:</b>  <b>Reciprocal exchange within community: majority of residents have good relationships with other people within social housing community. Main conflicts, like different hygiene hobbies, noisy, and problems caused by different moral characters, are solved in two ways: self-adjusting and coordination by local property company.</b>  <b>Individual recognition to the community: residents in social housing community have high acceptance to their communities. The public activities in community can strengthen the personal recognition to the living community. These activities greatly improve the personal interactions. And the newly developed relationships have been highly accepted.</b></p> <ul style="list-style-type: none"> <li>- Residents in western and northern clusters are more willing to live in social housing communities</li> <li>- People in communities that constructed after 2008, have higher willingness to live longer time</li> <li>- Residents of middle scale community have lower intentions of long-term living</li> <li>- People in fully mixed community may a bit less in preference of long-term living</li> <li>- Young age residents, particularly below 40 years old, are less willing to stay long-term</li> <li>- no significant difference between male and female</li> <li>- Higher educated people, particularly those achieved undergraduate or even higher studies, are less willing to stay long-term</li> <li>- More income, especially over 4000yuan monthly income, would reduce the willingness of long-term residence</li> <li>- People from households with identified status of low income, would be more willing to stay in long-term</li> </ul>								
Social cohesion	<p><b>Social cohesion: residents of social housing community and residents of peripheral commercial housing community, have demonstrate a parallel and positive willingness on developing a common relationship with the other side.</b></p>								
Social climate	<p><b>Social climate: the social climate of social housing community is acceptable. But the property security is not as good as personal security.</b></p>								
Residential satisfaction	<p><b>Residential satisfaction: residents are quite satisfied with the housing design, particularly the ventilation, lighting such basic conditions. And majority of basic facilities (e.g. street lighting, inner public space, schools and nurseries and shopping services), are satisfactory for surveyed residents. However, the building quality, provision of medical facility and management within community seems hardly meet psychological satisfaction of residents. In addition, people may prefer to live in a community with the convenient transportation, convenient connections to the work, good location and sufficient public services.</b></p>								

Source: own draft, CHAO.

## **Part IV**

### **Conclusion**

## 12 Synthesis, main findings and implications

The objective of this research was to examine whether residents in social housing communities in Guangzhou have experienced any problems in terms of unjust access to physical resources within the city or any psychological perceptions of injustice. Based on a theoretical review of spatial justice, this study extracted three key topics from past theoretical contexts, and then discussed them using an empirical study containing survey data collected mainly from 660 residents of 13 social housing communities in Guangzhou. The study attempted to explore the following questions pertaining to three main dimensions, namely, territorial distributive justice, economic inequality and locational discrimination (see Chap.1.3):

- Do residents in social housing communities have easy access to public facilities?
- Do people experience problems in accessing their workplaces after moving into social housing?
- Do residents experience social segregation or discrimination after moving into social housing communities?

This chapter firstly summarizes and synthesizes the three dimensions to explain spatial justice, then displays the results and main findings obtained from the empirical study. Finally, the study concludes by discussing the implications of methods for empirical studies and makes suggestions for practical measures. The survey was conducted in January and September 2013 and September 2014 in the city of Guangzhou. Interviews were conducted with officials and policymakers in the Guangzhou Bureau of Land Resources and Housing, and 580 questionnaires were completed by sampled residents from 13 social housing communities (i.e. Fanghe, Guocun, Dang'en, Jude, Tangde, Guangdan, Tai'an, Anxia, Zede, Jinshazhou, Jide, Huize Yaxuan, Likang), and 80 supplementary questionnaires were completed by 80 residents in Jude community.

### 12.1 Synthesis

Conceptually guided by the theory of spatial justice and empirically based on surveys, this analysis has empirically tested the living conditions (including employment status, travel behaviour and social communication) of 660 residents in 13 social housing communities. The concept of spatial justice, which stems from social justice theory, is a new thinking which relates to seeking social justice from spatial perspective (Harvey, 1973: 96; Soja, 2010a: 1). With reference to spatial turned principles of social justice (Havery, 1973: 107-108; Soja, 2010a: 47), two main dimensions of spatial justice can be identified: the first dimension draws on the physical redistribution of common goods, social needs and geographical resources. The second dimension stresses the spatial results by reason of processual justice. How does the decision-making process raise issues of residential segregation and neighbourhood integration?

Spatial justice is a helpful concept to guide the research theme, and the specific use of spatial justice in academic started in the 1970s. The adoption of quantitative approaches in spatial science (e.g. location analysis, model building and so on) greatly motivated the investigations of radical geography from the early 1970s. The first use appeared in a study of political geographer John O'Laughlin in 1973. From the 1980s, the term started to emerge in the works of geographers and planners in Los Angeles from a geographical perspective (Pirie, 1983; Flusty, 1994: 13). The value of Los Angeles efforts for spatial justice have been significantly confirmed by Soja (2010a: 111-178), particularly its proposition to recognize the structure of productions from a spatial angle and then to devise political strategies. With attention turned to disparities between spatial units, increasing discussions focused on marginalized groups, geographical patterns of social well-being, and quality of life in urban or regional areas. Subsequently, some researchers have advocated explanations for principles and their measurement in practice (Soja, 2009; Piries, 1983). The early works of Fainstein (2009) formulated criteria for spatial justice in empirical planning at urban level. He suggested three components for shaping a just city, namely, material equality, diversity, and democracy (Fainstein, 2009: 15-16). Investigations resting on three points have been applied in urban organization in New York, London and Amsterdam. Rawls' (1971) study not only tested the distribution of opportunities and power, but also examined the distribution of property. Then, the "urban common" of Chatterton (2010: 627) pointed out that such a common is a comprehensive form which consists of shared values or interests. The way of reaching an ideal urban common is to develop vital social resources, land and life-worlds for disadvantaged groups (Chatterton, 2010: 626).

This study mainly make reference to discussions by Soja (2010a), Marcuse (2009b) and Piries (1983), with consideration of some empirical studies on territorial distribution justice and locational discrimination. Soja's (2009: 2-3) interpretation of spatial justice provides a way of seeing both process justice and the outcomes of justice from spatial perspectives. Further, Soja (2010a) and Marcuse (2009b) have developed their principles to estimate spatial justice. This study makes reference to their outcomes and explores whether the experiences of residents in Guangzhou social housing indicate an unjust situation. Three dimensions in this regard are territorial distributive justice, economic inequality and locational discrimination. The first two concepts originate from the distributive outcomes of services and economy-related opportunities, while the third concept draws on processes related to location, education and personal beliefs of individuals with respect to social changes. Three empirical topics, accessibility to public facilities, job-housing connections, and neighbourhood integration, are used to capture and document issues of spatial justice respectively. This threefold interpretation may contribute to recognizing elements of spatial justice theory, and is also helpful to ascertain whether the perceived (in)justice of people are the results of policy-driven distribution or something else (e.g. locational economy that is driven by market forces). As such, locations may be characterized by the hierarchical service areas proposed in central place theory (Veneris, 1990; Openshaw & Veneris, 2003). This study also looks at spatial layout, taking account of the rules of central place theory, in order to avoid the biased results that may be caused by an exclusive focus on justice issues and a neglect of the rules of the market.

### 12.1.1 Territorial distributive justice: accessibility to facilities

The concept of territorial distributive justice was first proposed in geography to seek justice by addressing spatial importance in the real world (Davies, 1968; Walzer, 1983). Due to the advantage of responding the visible nature of space, a number of geographical studies have used territorial distributive justice to assess spatial justice. Even courageous discourses have suggested leaving out the legalistic parts, and have asserted briefly that the focus of spatial justice is distributive justice (Pirie, 1983: 465). These explanations of spatial justice have narrowed the scope, but they have highlighted the main body of what geography should do in regard to the issue of justice. With these opinions as reference, our study regards territorial distributive justice as the first dimension for measuring spatial justice.

Early studies on distributive justice suggested an equal distribution of basic needs (Smith, 1994: 116; Davies, 1968: 16). Boyne (1991: 263) insists that the essential requirement of territorial justice is proportional service provision to service needs. Lösch (1954: 520) also stated that equilibrium might remove the differences between goods that have a specific productive and consumptive function. Smith (1994: 148) has suggested understanding territorial-based distribution at the local, regional and international levels. At local level, this interpretation means territorial distributive justice. This phenomenon refers to the different access of territorially defined groups to common goods and services. This fact is associated with unequal distribution. Harvey (2009: 101-106) has considered the use of needs, contribution to the common good and merit as criteria for distribution. An ideal distribution across territories should fulfil such requirements: meeting the basic needs of people from each territorial unit, considering the spread effects of allocation to one territory unit on the circumstances of other units, and long-term allocation of extra resources to special situations like earthquakes or floods (Harvey, 2009: 96-116).

The just allocation of these things (material goods and economic opportunities) over spatial areas should provide equal access and meet individuals' needs. In empirical studies, distributive justice is commonly understood as the even allocation of the common good with respect to social needs within a certain area and implies that people have equally accessible opportunities (Harvey, 1973: 101). This concept mainly examines the evenness of geographical effects caused by the distributions of public services (e.g. health services, education, transport, police and crime prevention, housing and employment). Some other scholars have suggested the importance of considering "social needs". In Davies' (1970: 215) and Coates, Johnston and Knox's (1977) studies, quantitative indicators were developed. Territorial distributive justice as a topic may be viewed from both emic and etic aspects, that is, from both the objective, factual situation provided by space and the personal perceptions. In this sense, judging whether a distribution is just or unjust or is perceived as "just", should be based on the spatial outcome of services, transport connectivity between the residential location and the service point, as well as the personal satisfaction with the current provision. Specific to difficulties, one extreme measure defines the existence of territorial justice as being when a strongly positive correlation can be confirmed between the service provision and the indices that reflect the needs of individuals (Davies, 1968: 16).



In seeking just access to healthcare, Daniels (1985: 36) suggested an opinion on the equality of opportunity. While his justification summarises many principles (e.g. procedural fairness, merit, needs) and narrows down the range of justice to opportunities for equal access to services, it still gives reference to how to apply substantive equality in empirical studies. This analysis has provided valuable ways to understand equity of access (Daniels, 1985: 59-85). Equitable access should contain three conditions: utilization for needs, equality in process variables, and market availability for a decent basic minimum. The application of the first condition is to seek the impacts of potential effects on the differences in access. The potential effects include structural features of the medical system (such as the availability of hospitals and physicians) and process factors (such as age, health status, education, income level, insurance coverage level and so on) (Daniels, 1985: 63). The process variables of the second condition refer to information on travelling or waiting time, which are used to reflect the access people actually have (Daniels, 1985: 69). The third point indicates the constraints of the market in catering for people's preferences. It means some groups may have difficulties accessing healthcare in the desired quantity or at the desired time because market decisions on the distribution of services do not consider consumers' preferences (Daniels, 1985: 72). Therefore, accurately defining subjective needs has to take many aspects into consideration. Formulating the indicators of territorial justice in empirical studies is a significant challenge; this study takes personal needs and distribution into consideration.

Chapters 6 and 7 attempted to present distributional injustice by identifying "the accessibility of public services". Geographic accessibility is measured by means of travel time, travel cost and travel mode as indicated by the people surveyed. Accessing effective resources is examined by measuring of geometric distance and additionally considering the servicing ability of the facility. Analyses in this dimension are completed by using mathematical methods in the tools EXCEL and SPSS for calculating numbers, frequencies, regression analysis; and spatial analysis methods, like interpolation, overlay analysis and spatial statistical analysis, on the platform "ArcGIS", in identifying the spatial characteristics of services location and housing location.

### **12.1.2 Economic inequality: job–housing relationship**

Economic inequality is abstracted from territorial distributive injustice and is used to define the effects of the spatial distribution of job opportunities and living places on employment behaviours. In the perspective proposed by Lefebvre (1968) about "the right to the city", achieving justice should be seen as both an outcome and a process of distribution and redistribution (Purcell, 2002: 102). In this sense, everyday activities of urban functioning (e.g. economic activities, political participation, and social networks) may result in dynamic inequality or unjust conditions. Everyday activities, as the prominent economic activity, directly influence individuals' locational decisions and accumulation of capital, and may further result in reduced or aggravated redistributive injustice (Soja, 2009: 3). Several scholars have suggested significant perspectives in their conceptualized systems for identifying economic inequality. One widely used concept in defining spatial relationships between job and residence is the spatial mismatch hypothesis (SMH) (Kain, 1968: 180; Holzer, 1991; Orfield, 1999: 37; Galster & Killen, 1995; Galster & Mikelsons, 1995). In terms of this concept, both geographical matching (job access and job proximity) and opportunity matching (accessibility of labour markets or suitable jobs) are involved (Ihlanfeldt & Sjoquist, 1989; Stoll, 1999). Therefore, the study of economic injustice entails two topics: one is the employment situations of residents in social housing, and another is the supposed commuting and access difficulties brought about by the residential location in economic participation. The changes that occur after resettlement in social housing, both relating to commuting behaviour and occupational level, were used to elaborate on redistributive (in)justice in the economic realm.

The main methods used in examining SMH regarding accessibility are regression and spatial analysis. For instance, Liu and Painter (2012: 992-993) applied regression models to test population and employment movements in relation to factors that may be correlated. Some studies have found a negative correlation between job access and the welfare usage rate. Job-rich areas have lower welfare usage rates while job-poor areas have higher ones (Osterman, 1991). This proves that welfare recipients may have inferior job access. In addition, study by Ong and Blumenberg (1998) showed that the employment of welfare recipients appear to be associated with nearby job opportunities. The welfare recipient is an important targeted group in spatial mismatch analysis. Studies on the SMH focus on the underclasses who are minority groups (e.g. blacks, Hispanics, and Asians) or lower-skilled employees. Welfare recipients with lower income levels are commonly engaged in lower-skilled jobs. Therefore, these results have shed light on our study of the SMH as it pertains to social housing recipients. Local low-income households in Guangzhou have largely moved into

several social housing neighbourhoods, within which the poor are highly concentrated. Measurements of SMH are helpful for identifying the access to jobs or job-rich areas for social housing residents and would assist us to know whether they experience any spatial injustice regarding employment.

Chapters 8 and 9 have dealt with redistributive injustice across the research area. Social housing communities display concentrations of groups with inadequate socioeconomic, physical and political abilities. The households consist of low-income families, poor families, families with reduced mobility, single and elderly families, families of martyrs and some lower middle-income families. Prior to the examination of the job–housing relationship, it is important to know the employment status of the persons surveyed, the work environment around their place of residence and the availability of suitable job opportunities in close proximity. The study then analysed the situation relating to job–housing connectivity after moving into a new residential (social housing) location. Can people access their former workplaces easily? Whether the commuting distance and commuting time increased or decreased with the change in living location? Answering these questions can give clues about the job and housing relationship. In addition, the job–housing relationship is not a stable phenomenon but a dynamic process that relates to individuals' decisions. The way residents assess their experienced connections between place of work and place of residence may result in certain actions in response. If people change or have strong desire for a new spatial relationship between job and housing, what factors may affect their reorganizing behaviour? The survey data from 13 communities provide the possibility to identify these influences using statistical analysis. By means of statistical analyses, details of the relationship between job and housing can reflect how easy or difficult it is to access jobs. Using survey data, this study has explored employment status, occupational level, commuting behaviours and occurrence of job relocation. Finally, job relocation behaviour was analysed using individual data, household features and job features, with the aim of discover its effective influences.

### 12.1.3 Locational discrimination: neighbourhood integration

In addition to the stated spatial outcomes, the residential location also results in social effects or social attitudes. Some people suffer from social bias because of their location. Concepts of spatial injustice hold that locational discrimination may be an important element since the concentration of residents of vulnerable groups may result in that community being excluded from the normal social networks and surrounding society. In his theoretical framework of spatial justice, Soja (2009: 3) identified negative socioeconomic phenomena as locational discrimination, while some studies viewed this from the angle of residential segregation (Cheshire 1979b; Inlanfeldt & Sjoquist, 1989: 122). These negative social outcomes have been explored in topics regarding social polarization, social bias along class, race and gender lines, residential segregation and marginalization (Kain, 1968: 196; Ellwood, 1986; Leonard, 1986; Stoll, 1999). The social housing community within which people with weak economic ability concentrate, has been presumed or verified as the geographical unit with a high-risk of residential segregation from the outside social environment (Logan, 2003: 38; Squires & Kubrin, 2005: 47; Galster, 2005: 124). However, when defining what social effects the residents experience, it is important to clearly identify whether situations are within or outside the residential unit. With respect to the application of theories (residential segregation, neighbourhood integration, social cohesion etc.), several concepts (e.g. social communication, social participation, sense of community, residential satisfaction) have made contributions to measuring social effects with feasible indices.

Essentially, locational discrimination is a series of social phenomena that are caused by spatial attributes. The outcome of locational discrimination is more than a “segregation” pattern; it refers to the excluded social position of a unit from surrounding lives and relationships (Armstrong, 2012: 624). We cannot discuss this without thinking about the essential characteristics of local social ties, relationships, lifestyles and even aesthetic values (Harvey, 2008: 23). Thus, exploring locational discrimination against a certain group is a process of understanding the social performance of a targeted group in a specific living environment. The social performance of a group entails social relationships, social ties, interactions with other members and participation in political or social activities. The study of locational discrimination closely related to research on social inclusion/exclusion, social segregation/integration, cultural integration and violence. At the community level, local discrimination has been explored in terms of neighbourhood integration/segregation with the aim of understanding what degree of exclusion in the local environment can be defined as spatial injustice. In discussions, local geographic features are considered in searching for social phenomena. However, many scholars who focus on social justice are rarely touch on locational discrimination. They treat people in different locations indiscriminately. Identifying the rights and voices of people also ignores the effects of the specificity

of geographic units. In this sense, studies from this perspective do not match the purpose of locational discrimination. Recent studies at community level have made reference to the concept of spatial justice, but they rarely respond the link between justice and integration, and injustice and segregation.

Most social housing communities are situated in places distant from the city centre. Newly-built large communities show distinctly different residential patterns in suburban areas compared to more centrally located social housing communities. There is a possibility that the concentration of weak groups results in a lack of acceptance by the surrounding residential communities. Homogeneity within the unit and heterogeneity with respect to the surrounding residential areas would tend to strengthen a “ghetto effect”, i.e. the emergence of separate communities and inadequately integrated people.

With respect to both theoretical and methodological outcomes, the study conceptualizes a structure with detailed indicators to document whether or not residents are socially segregated either within or from outside their residential units. The integration of neighbourhoods includes three dimensions: physical integration, social integration and psychological integration (Aubry & Myner, 1996: 10; Ecker & Aubry, 2016: 111). Testing of the first two research questions will address the aspect of physical integration, and the third question focuses mainly on social and psychological integration. The examination of social integration aims at understanding participation in political (communication with institutional agencies, police, media etc.) and sociocultural activities (cultural exchange, recreation, outdoor leisure, volunteering etc.), contact with neighbours and outsiders in the community. Regarding psychological integration, we tried to identify by means of a survey emotional dependence, belonging to a community and willingness stay long term. However, the study also explored whether the urban form (the form of the community such as location, building time, size and housing mix) or personal attributes of the residents (age, education, income etc.) have effects on neighbourhood integration. Chapters 10 and 11 dealt with two dimensions: social integration and psychological integration, and studies them using indicators of social participation, interpersonal communication, sense of community and residential satisfaction. The basic data were surveys completed by 660 residents in 13 social housing communities in Guangzhou.

## 12.2 Discussions and main findings

Answering questions in line with the three dimensions can assist in understanding whether distributive injustice, economic injustice and discrimination are perceived by residents in social housing, or are indeed emerging. Findings relating to the accessibility of public services, employment behaviour, and integration in social functioning not only address the main notions of the spatial justice conceptualization, but also may answer whether other causes (e.g. locational economy) may lead to different accessibility, employment behaviour or integration among residents in the surveyed communities.

### 12.2.1 Finding 1: accessibility of facilities

**Overall, measures of the accessibility of facilities demonstrate two main findings. First, residents of social housing communities are quite close to the facilities needed daily (e.g. basic medical facilities, nursery and elementary schools, convenience markets, and public transport station). Hence, they may not experience injustice in accessibility. Second, residents of communities in peripheral locations (in the districts of Tianhe and Baiyun) may apparently suffer from certain injustice problems in accessing facilities: medical facilities, middle schools, shopping malls, parks and metro stations. Residents of communities located in areas close to the city centre have easy access to these facilities (medical facilities, middle schools, shopping malls, parks and metro station). They can reach enough services in a short time by an easy travel mode and they show greater satisfaction. For those in communities in peripheral locations, they not only show difficulties in access, but also display a low satisfaction.**

To find out whether residents in social housing can easily access public facilities, this study examined the distance between residential location and facilities, the travel time to reach facilities, whether the services meet personal expectations or not, and the causes of different accessibility. Our discussion was based on the surveyed commuting

data and spatial information. In order to test overall, the study involved the services needed daily with reference to the criteria for social well-being proposed by Smith (1973: 70). The study selected nine essential facilities: nursery and elementary schools, meat and food markets, convenience supermarkets, nearest bus station, medical facilities, middle schools, shopping malls, the nearest park and the nearest metro station. Among these services, first four are commonly provided within the social housing area or just adjacent to the housing. Middle schools are attached to several large-scale (see in Tab.6.1), and small-scale communities (e.g. Fanghe, Guocun and Likang) are not designed with middle school but share neighbouring facilities. Medical facilities close to social housing communities are normally primary health services such as physicians and clinics. Comprehensive hospitals with better medical technology are generally far away. Other facilities like shopping malls, parks and metro stations are not physically integrated in social housing as they are not regarded as essential services for social housing communities but are rather an urban public resource. Their distribution may be significantly influenced by city planning, marketing and the ecological environment. In addition, the study has classified the nine facilities into three groups according to the surveyed travel time and travel mode to reach these facilities: most accessible facility (MOS), less accessible facility (LES) and least accessible facility (LEA) (Chapter 6.1). Subsequently, these were separately analysed in line with commuting time, spatial distance and satisfaction, see details in the following section:

**Most accessible facility (MOS): Residents in social housing communities may not experience injustice in reaching very basic facilities (i.e. nursery, meat and food market, convenience supermarket, bus station), but they may have disadvantages with regard to enjoying abundant and good quality services.**

According to the responses of the 660 residents of social housing, most can reach very basic facilities (i.e. nursery, meat and food market, convenience supermarket, bus station) within 20 minutes on foot (see results in Chapter 6.2.1, 6.2.2, 6.2.3, 6.2.4, respectively). Simultaneously, they show a high satisfaction towards the distance between housing and facilities. The spatial layout and location of these four facilities around social housing community therefore meet the basic demands of residents. The survey only showed a disparity among surveyed residents in new communities built after 2010. Residents experience some disadvantages in accessing the first three facilities (nursery and elementary schools, meat and food markets, and convenient supermarket) and reflect a lower but still positive satisfaction with the distance. This situation implies that the basic services of newly -built communities may require certain improvements and residents may also need to adapt to the new environment. These results show that commonly residents in social housing communities do not suffer spatial injustice in accessing basic social facilities.

The results of Chapter 6.3 revealed that respondents perceived that the supply quantity of the most accessible facility (MOS) basically meets their satisfaction, but the quality of these facilities hardly satisfies them. The lack of satisfaction or dissatisfied evaluation is significant among residents of communities that are peripherally located or built after 2010. These findings may indicate that residents in social housing communities (particularly in those peripherally located and built after 2010) experience some disadvantages in enjoying abundant and effective services as expected. This is a sign that most residents of social housing communities may experience slight injustice in accessing adequate and well-organized facilities that meet basic needs.

**Less accessible facility (LES): As to the accessibility of medical facilities and middle schools at the basic service level (e.g. physicians, basic middle schools), most residents in social housing communities did not experience injustice problems, except those in specific communities (e.g. communities remotely located, or with very short length of residence). Moreover, no injustice was identified among these residents in reaching LES at key level.**

*Basic and key medical facilities.* Except for those living in communities in Tianhe district (Tangde, Guangdan, Tai'an and Anxia) and very remote areas of Baiyun district, most residents of social housing communities experience no obvious injustice problems regarding distance to medical facilities (includes basic healthcare and key hospitals). However, they may experience some disadvantages in accessing sufficient numbers of physicians for basic healthcare.

In terms of the results of Chapter 7.2.1.1, the location of basic medical facilities is close to social housing communities. Most communities are located within a service area where facilities may be reached by no more than a 40 minutes

walking. Particularly, a high percentage (around 80%) of respondents from the surveyed social housing communities near the city centre area, in Liwan and Haizhu district, indicated an obvious advantage in accessing basic medical facilities within a short travel time (within 20 min) and easy travel mode (by walking). However, as concluded from the results of Chapter 7.2.1.3, within a travel time of 20 minutes, residents in social housing communities (particularly those in communities of Tianhe, Baiyun district and those in communities built after 2010) would find it difficult to reach a comparable quantity of basic physicians as people of the central area of Guangzhou. The ratio of available physicians to the population in social housing communities remains at low level when compared with the ratio of other locations in the city of Guangzhou. This may indicate that within 20 minutes travel time (either by foot or by bus), accessibility of social housing residents to available basic physicians is not as high as people in the city centre area. The accessible number of physicians for basic healthcare is low for current residents in social housing communities, and is particularly low for those people in Tianhe district and very remote regions of Baiyun.

As to the accessibility of key medical facilities, there is no evidence to show that social housing residents experience any disadvantages in accessing key hospitals. Most the surveyed social housing communities are located within the service area of 40-60 minutes walking distance or 20-40 minutes by bus of key hospitals. Within a threshold travel time of 20 minutes by bus, the accessibility value of most surveyed social housing communities (except communities in Tianhe and remote Baiyun district) reach a medium level compared with other locations in the city area. This means that most social housing residents (except those in Tianhe and remote Baiyun district) can access a certain number of physicians at key hospitals within 20 minutes by bus, though the available number is not as high as people in the city centre area, nevertheless no notable disadvantages appear. The fact that it may take longer to get to key hospitals than basic health facility may be caused by market forces. As explained by the location economics of central place theory (CPT), upper-level facilities serve larger areas while the lower-level facilities serve small areas. It may take longer for the population demanding them to reaching higher level services like hospitals. The distribution of key hospitals also obeys this location principle. For most residents in social housing communities, no disadvantages with respect to access to key hospitals are experienced, but they may experience some difficulties in reaching the physicians available for basic healthcare. Nevertheless, residents of communities in Tianhe district (e.g. Tangde, Guangdan, Tai'an and Anxia) and communities in very remote locations (e.g. some new projects lie in the middle or northern region of Baiyun) may suffer severe difficulties in accessing both of basic medical facilities and key hospitals.

Like the result of the satisfaction analysis (see Chapter 7.4), respondents in communities near the city centre are very satisfied with the distance, while the satisfaction of those in peripheral areas is weakly positive. The gap also appears in the evaluation on physicians' ability and reliability at medical facilities. Respondents in Liwan and Haizhu stated weakly positive satisfaction, while interviewees in Tianhe and Baiyun responded with a negative assessment. This may imply that residents' demands for service quality at medical facilities can be basically fulfilled in communities near the city centre, whereas the demands of residents in peripheral communities haven't been met.

*Basic middle schools and key middle schools.* From the discussion in Chapter 7.2.2 on access to middle schools and in Chapter 7.4 on satisfaction, residents in most social housing communities experienced no significant injustice problems regarding the access to middle schools. However, those in new communities built after 2010 (i.e. Guangdan, Anxia and Huize Yaxuan) did have some disadvantages. In addition, access to key middle schools may be strongly linked to the layout of the city rather than the location of social housing. The closer the community to the city centre, the more convenient residents' access to key middle schools.

Apart from the inconvenience experienced by residents in new communities built after 2010 (i.e. Guangdan, Anxia and Huize Yaxuan), residents in the other ten surveyed social housing communities experienced no significant disadvantages in accessing basic middle schools. Their distance to basic middle schools and required travel time are comparable to people in the central area of Guangzhou. Only new communities built after 2010 (Guangdan, Anxia and Huize Yaxuan) show some disparities. Moreover, residents of several communities near the city centre have good accessibility to key middle schools, while residents of other communities, particularly remotely located ones, may experience disadvantages. Most social housing communities are located at a far distance from key middle schools, but their residents can reach key middle schools within 20 minutes by bus. As with the location of key hospitals, the spatial distribution of rare resources (like key middle schools) is driven by economics. Longer travel time or faster travel modes

are required in accessing key middle schools than basic middle schools. In addition, access to key middle school decreases as the location of communities becomes more remote. There are notable disparities between social housing communities near the city centre and those distant from it. This indicates that a location near the city centre (e.g. Dangen, Jude) has advantages for reaching key middle schools.

Furthermore, respondents in communities near the city centre area have obviously greater satisfaction with the distance to middle schools and with the schools' faculty and educational quality, while respondents in communities in Tianhe district indicate much lower and slightly negative satisfaction. Similarly, the assessment of quantity of faculty and educational quality is higher in Liwan (0.56 and 0.59) and Haizhu (0.46 and 0.27), and much lower in Tianhe district (-0.02 and -0.07). Notably, respondents in new communities built after 2010 also demonstrate lower satisfaction values for middle schools. The values for distance, quantity of faculty and educational quality are -0.72, -0.32 and -0.25 respectively. The large gap in satisfaction reflects that respondents in these communities (Guangddan, Anxia and Huize Yaxuan) are a bit dissatisfied with the service of middle school facilities. They may think the middle schools are not close enough and the education they provide is quite normal.

**Least accessible facility (LEA): Though the distribution of these facilities is also driven by market forces, and may be limited by the objective environment, most residents in social housing communities (except those near the city centre) may suffer some injustice in terms of their access to shopping malls, parks and metro stations.**

As identified from the results on service areas, survey data (see Chapter 7.2 & 7.3) and satisfaction assessment (see Chapter 7.4) about access to shopping malls, parks and metro stations, it would appear that the access among residents in social housing is commonly low, except for those near the city centre.

*Shopping mall.* There appear to be fewer shopping malls in the areas surrounding communities in Baiyun and those built after 2010. This lack of shopping mall facilities result in lower access for residents. In addition, the respondents in communities in the districts of Baiyun and Haizhu and those in communities built after 2010 indicated significantly lower satisfaction with the distance to shopping malls and selling prices at malls. Respondents in Liwan indicated much higher satisfaction with distance (0.86) and price level (0.26) than respondents in communities in other districts. The satisfaction value for distance decreases to 0.40 for Tianhe, -0.04 for Haizhu, and -0.31 for Baiyun. Noticeably, respondents in communities in Liwan are satisfied with access to shopping malls, while respondents in Baiyun and Haizhu are dissatisfied with their access to shopping mall facilities.

*Parks.* The accessibility of parks for residents in communities in Baiyun would be lower than residents in other communities. The new projects in regions in the southern Huangpu and middle and northern Baiyun are also a long way from parks. Residents in these locations may find it difficult to access parks.

*Metro stations.* To conclude the analysis results, the metro lines are intensively located in the central area, and the communities of Fanghe, Guocun and Dang'en (in Liwan district) are situated close to metro stations. The survey results indicate that respondents in Liwan district and respondents in communities built in 2008-2010 have advantages in accessing metro stations. Up to 88.5% of surveyed people in communities in Liwan district indicated that they were able to reach a metro station within 20 minutes, and 98.6% of them travelled on foot. The percentages decrease to lower levels among respondents in communities in Tianhe and Baiyun. Only 43.9% (Tianhe) and 32.6% (Baiyun) of surveyed people can reach a station in 20 minutes, while another 45.8% (Tianhe) and 49.8% (Baiyun) required longer travel time (20-40 min). At the same time, fewer of them travelled on foot (35.5% in Tianhe and 29.6% in Baiyun) and more of them chose a faster mode of travel, i.e. bus (51.6% in Tianhe and 58.8% in Baiyun). These data may imply that residents of communities in Liwan district have very convenient access to metro stations, while those in communities in peripheral areas, particularly in Tianhe and Baiyun, show clear disparities. In addition, the rate of respondents in communities built in 2008-2010 (i.e. Fanghe, Guocun, Dang'en, Jinshazhou, Tai'and and Likang) also indicate easier access to metro stations.

### 12.2.2 Finding 2: influence of residents' perceptions on accessibility of facilities

**Residents' assessments of services provided by facilities depends largely on the distance to the facilities needed daily, as well as to the quality of basic education, the quality of basic healthcare and the price level of basic commercial goods.**

By means of main factors analysis and linear regression analysis (see Chapter 7.5), four factors were identified as having positive correlations to the dependent variable "satisfaction with facilities". Of the four factors, the  $F_1$  (Near to daily needed facilities) demonstrates the highest coefficient (0.342), which indicates the strongest effects on overall satisfaction. Hence, the shorter the distance to facilities needed daily, the higher the satisfaction will be. The influence of  $F_4$  (High quality of medical facilities) is second highest (coefficient is 0.275). If the quality of accessible medical facilities improves to some extent, residents may accordingly be more satisfied with them. Factor  $F_3$  (Cheap prices at commercial facilities) produces the third highest strength effects (coefficient is 0.220). When the prices at commercial facilities, i.e. local shops, are lower, residents will be more satisfied with services of these facilities. In comparison, the factor  $F_2$  has smallest correlation with the dependent variable (coefficient is 0.199). If the quality of educational facilities increases, residents' satisfaction will also increase. To conclude, the residents' satisfaction is primarily dependent on the convenience in accessing the very basic facilities (e.g. nursery and elementary schools, convenience markets, bus stations, basic healthcare and so on). It may indicate that the distance to facilities that are not required every day (e.g. parks, key hospitals) may have no significant effects on the satisfaction of social housing residents. Nevertheless, residents are concerned about the quality of healthcare and education and the price level of commercial services.

### 12.2.3 Finding 3: employment situation among social housing residents

**Retirement may be one of the main reasons for the low employment rate in social housing communities in Guangzhou. In addition, the fact that social housing residents have lower levels of education would limit work opportunities available to basic services with lower skill requirements.**

By analysing the reasons for unemployment and the occupational level, we found that the low employment rate in social housing communities is largely caused by retirement; that is, the age of social housing residents is one of the main causes of the low employment rate. At the time of the survey, the percentage of non-working respondents reached 72.4%. Nearly half of non-working respondents had retired (see Chapter 8.3.1). At the same time, the able-bodied workforce in social housing also demonstrated low initiative to participate in the labour market. The employment of social housing residents is highly sensitive to factors like long travel times, predominance of skilled jobs, welfare programmes, and individual or household restraints. Some may quit their jobs owing to the heavy burden of household responsibilities, while some unemployed residents have difficulties in finding suitable jobs because of a lack of skills. Nevertheless, there is also a possibility that people initially refrain from employment because of welfare benefits. The survey respondents reflected that the working potential of social housing communities is moderate (56.1% of respondents form part of the able-bodied workforce), and nearly half of the able-bodied workforce is out of work (28.5% of respondents are unemployed). Meanwhile, results pertaining to the various reasons for not working (see Tab.8.3) indicate that the unemployment of able-bodied respondents is caused mainly by household restrictions.

Analysis of the reasons for unemployment and of the occupational level of respondents revealed that the educational level is an important factor linked to job opportunities, particularly among males. While household restrictions largely affect the employment of women, difficulties finding jobs in the labour market may be more likely linked to unemployment among males. Accordingly, 28.4% of non-working female respondents stated that family conditions restricted them from participating in the job market; whereas, only 4.7% of non-working men were out of work for this reason (see Tab.8.3). Non-working residents who were less educated demonstrated more difficulties in job seeking than those with higher levels of education. The reasons for the unemployment among the latter group with high educations are less about external difficulties presented by the labour market and more about personal choice in relation to their own families. While a high percentage of less educated respondents ("no education": 8.3%, "primary school": 11.6%, and "middle school": 11.7%) think that jobs are difficult to find, the percentages fall to 4.9% among surveyed people who have educations of "high school" and 4.9% among the surveyed people who have educations of "undergraduate study". In

addition, the work opportunities available for social housing residents may be highly concentrated in the basic services, thus providing jobs with lower skill requirements. The limited working range and demonstrated low positivity to participate in the job market may jointly result in the low employment rate among social housing residents. From the data displayed Tab.8.4, we notice that the overwhelming majority (79.0%) of respondents are working in low-skilled occupations compared to 21.0% in more skilled jobs. A total number of 46.1% of respondents work in the provision of basic services with fewer requirements for technical skills (e.g. wholesale and retail services, residential services, catering services). Another 16.5% of respondents are engaged in goods-producing services such as transportation, construction, manufacturing etc. As to higher-skilled jobs, 18.7% work in professional services, and only 2.4% take part in governmental services. The vast majority of employed respondents work in low-skilled jobs.

#### 12.2.4 Finding 4: job–housing relationship

**No significant evidence was found to indicate that current residents of social housing are suffering from injustice in relation to their current employment behaviour. However, after moving into social housing, in the beginning many of them indeed experienced inconvenience accessing jobs and job opportunities.**

In order to know if residents in social housing experience problems related to economic injustice, this study explored the job–housing relationship along two dimensions: spatial matching and occupational matching. Spatial matching was examined using the geographical features between workplace and the place of residence, and occupational matching was demonstrated using the occupational environment in the areas surrounding social housing communities. Then logistic regression of statistical analyses was used as a way to find out the possible influences on changes in the job–housing relationship. By confirming the (non-)existence of significant mismatching, we tried to ascertain whether residents in social housing suffer any economic injustice.

The spatial mismatching of job and home is not particularly obvious among residents in social housing communities. Moving into social housing resulted in some inconvenience for employed residents, particularly those in communities distant from the city centre, such as Zede in Baiyun district. The results in Chapter 9.2.1 and 9.2.2 show that residents relocated into social housing become involved in an employment re-concentration process, from employment previously being concentrated in the city centre area, workplaces then tend to show a trend of residence-centric aggregation, in other words, of moving closer to home. Simultaneously, employment distribution shows a polarization trend as the ratio of jobs close to home and jobs far from home increasing, and the ratio of medium-distance jobs decreasing. The change is closely linked to the long distances travelled and the inconvenient transportation between work and home caused by moving into social housing. Residents in comparatively distant communities experience more disadvantages in terms of job–housing match than people in other communities, which may be ascribed to their higher commuting costs and longer commuting times. Drawing from these outcomes, we discover that the resettlement of low-income families into social housing community greatly influences people's behaviour regarding new job–housing spatial connections. The comparatively distant location of social housing not only results in higher commuting costs and longer commuting time, particularly for residents in distant communities that have stable and ideal jobs, but also drives people to seek new jobs nearer the social housing rather than jobs in the urban centre. However, with a change in workplace, this inconvenience decreases to some extent. Many employed respondents have found new jobs in places in their area. Only small number of them (particularly those with higher education or with very stable jobs) are enduring the inconvenience of commuting.

In addition, no obvious occupational mismatching was demonstrated. The social housing communities are mostly situated in places where many commercial services and residential services are provided. As residents of these communities are mainly employed in these low-skilled occupations, there is a positive link between the employment expectations of residents and the local occupational level. Therefore, residents in social housing may not have problems travelling long distances to suitable work opportunities. New residences provide a higher density of proximate occupations in low-skilled services like commercial and residential services, which may attract social housing residents to perform in this labour market. That is to say, the employment situation of social housing residents can be greatly improved by providing proximate opportunities for lower-skilled occupations. To conclude, the mismatching problem could be resolved as the length of residence in social housing community increases. Despite long distances or lengthy



travel time to reach works in the beginning, positive changes in residents' employment by may gradually reduce the inconvenience in moving between job and housing.

### 12.2.5 Finding 5: influence of workplace and occupation change

**Working in a stable job may greatly reduce the possibility or intentions for job change in terms of location or occupation, even if residents have to endure some difficulties in commuting. In contrast, long distances or inconvenience in reaching the workplace may increase the probability of or intentions for finding a new workplace near the home. In this case, changes in occupation may not be related to a change in the spatial connection between job and home caused by moving into social housing, but rather associated with the wage level, social network and personal interests.**

With the purpose of exploring the effects of people's behaviour or intention to change workplaces or jobs, this study used two methods. One was a direct question relating to the reasons in the questionnaire with the results being demonstrated by radar analysis; another is logistic regression analysis in which more attributes such as household income level, education, gender etc. were jointly tested. The results are summarized in Tab.9.16, accordingly, influence and main effects are as follows:

- 1) The stability of the job always strongly and negatively affects any changes in people's employment. In terms of the determinants of regression analysis regarding the changes that occurred in job location and occupation, and in intention to change workplace and occupation, a notable finding was that continuing participation in employment may reduce the possibility of these changes, both in terms of location and occupation. Length of time in a job is positively related to intention to remain in the current work. As may be seen from Tab.9.16, "employment participation" always acts as the prominent force that correlates negatively with workplace relocation, occupational change, and any future plans to change jobs. This results indicate that no matter how far the distance to the workplace increases as a result of the new living location, a stable and guaranteed work opportunity will reduce the intention to change jobs. The surveyed people will tolerate longer distances and worse commuting conditions after moving into social housing, rather than moving to a new job that is spatially proximate. Similarly, with regard to the desire to change occupations, a guaranteed job opportunity greatly reduces the desire to find a new type of work.
- 2) Moving into social housing may increase the occurrence of work relocation. Two main positive determinants (Tab.9.16) are long distances between workplace and residence and inconvenient spatial connections. After people resettle in remote social housing communities, the majority have to confront the greater spatial distance between workplace and housing and need to handle inconvenient commuting connections. The spatial difficulties involved in accessing the job greatly increase the fact of finding a new workplace. Some surveyed workers tried this way to solve their spatial mismatches caused by housing resettlement. Workplace relocation among social housing residents is impelled mainly by spatial connections between job and housing.
- 3) Changing occupations may be largely related to the work environment and individual features. The main positive determinants of occupational matching are socially related attributes. Higher wage levels, better social networks and stronger personal interests increase the occurrence of searching for a new occupation. Simultaneously, females and people who take on more family responsibilities may find it easier to change their occupations than others. In terms of the effects, we know that moving into social housing, i.e. residential relocation, has not brought notable effects on occupational change. The results reveal that occupational change is much different to spatial changes, mainly influenced by social causes like working experiences, gender and household restriction rather than any spatial effects.
- 4) Intention to change jobs or occupation is strongly and positively linked to better working conditions. With respect to the influence of aspirations, several social factors rather than spatial factors work as notable forces. A better working environment in the target jobs produces significant positive functions to strengthen the intentions of both people who have plans to seek a job in a new place and people who desire to participate in a new occupation.
- 5) Moving-out pressure may reduce surveyed workers' intentions to change workplaces and occupations, while household economic situation produces positive effects. Both intentions to change location and occupation demonstrate

significant associations with several social factors like moving-out pressure and the household economic situation. As indicated in Tab.9.16, moving-out pressure has a negative effect while household economic situation has a positive effect. Increased economic levels may increase people's expectations for a new job or a new workplace, and lower economic levels make people less inclined to think about performing in a new occupation or at a new place. Moving-out pressure has a significant effect on people's lives in low-rental housing, because when their income levels surpass a upper point they may experience pressure from managers to leave social housing. People who are pressurized in this way may have reduced intentions to make job changes. In addition, being female is negatively linked to intention to seek a new job, that is to say female exhibit lower job mobility than males.

### 12.2.6 Finding 6: neighbourhood integration

**No psychological exclusion exists. Social housing residents appear to be effectively integrated into the local environment. They have developed a better network within the community, and those aged over age 40, less educated or have a low-income may have a strong dependence on it.**

By conceptualizing an index system for testing neighbourhood integration (see Tab.10.1), this study estimated the social integration and psychological integration of residents in social housing from 660 survey questionnaires. Social integration aims to analyse the social participation and social communication of residents, while psychological integration attempts to ascertain the sense of community, social cohesion, social climate and residential satisfaction. The analyses here mainly used statistical methods to calculate frequency, percentages of relating to questions proposed in the questionnaire. In the following paragraphs, we briefly summarize findings relating to social integration and its influence (see Tab.11.36).

*Social participation.* Residents in social housing communities seems to be greatly interested in joining political organizations that function at community level and are closely relate to daily life, but they appear to rarely join sociocultural activities except outdoor leisure activities.

In accordance with the analyses in Chapter 11.1.1.1 relating to political participation and Chapter 11.1.1.2 relating to sociocultural participation, we found that the most participated in political activities include those held by the property company, the district neighbourhood committee and the district street office. Residents demonstrated much less interest in participating in organizations that function at city level. Nevertheless, nearly 80% of respondents rarely get in touch with the owner committee, the police station and the media, which implies that social housing residents rarely utilize their public power or owners' rights. In addition, over 70% of people responded they never or seldom participated in sociocultural activities such as elections for the community, cultural activities at the community centre, recreational activities, volunteering activities, spontaneous donations and discussions. However, their participation in outdoor leisure activities was much higher, with 23.5% of them were joining in very often, and 13.5% of interviewees participating every time.

Then, by cross tabulating the factors to the participating behaviours (see Tab.11.3 - Tab.11.21), we identified the significant factors and their effects on the social participation of people in social housing. Firstly, the length of residence, scale, education and special status appear to be positively linked to political participation, while income level produced negative effects. Despite the fact that overall participation in most sociocultural activities (except outdoor leisure) is quite low, the length of residence, age, education and income level still improve participation to some extent. It should be noted that the positive link between the income and participative behaviour is clearer among people with a monthly income below 4000 yuan. At the same time, the scale and the mixed type of community also have weakly positive effects. However, households with limited economic ability show lower participation in most activities except outdoor leisure. To summarize, people in communities that were built earlier or of a large-size and mixed dwelling mode design, may have more participants involved in political and sociocultural activities. In other words, longer length of residence and large numbers of neighbours may provide more opportunities for communication between people and may greatly increase people's participation in activities. Simultaneously, better educational experiences and higher income levels also have positive effects on individuals' participation in many social and cultural activities. Nevertheless, participation has a special relationship with the household status. People from families with lower economic ability, such as low-

income families and low insurance families, have more contact with administrative organizations than people from common families.

*Social communication.* Residents in social housing communities may have successfully established their social networks within the communities in which they live rather than outside. They have psychologically close connections with people who are spatially close, with the same social identity or similar hobbies.

New friends in the community form an essential part of the respondents' social networks. The fact that over 80% of the 660 interviewees had more than five friends, and over 60% had more than ten friends after resettling, indicates that respondents' have built up effective new social networks within the social housing communities. As the number of newly friends demonstrate a similar situation, it is reasonable to assume that the group of new friends constitutes the main part in an individual's social network within the community. However, individual's contact with people in neighbouring communities is far less. Up to 36.2% of people had not made any friends in the peripheral community and 50.0% of respondents in social housing had never visited the neighbouring community. Interaction between the two groups was accordingly not frequent, but in comparison, the residents in the surrounding commercial housing communities showed greater interaction with the social housing residents. Moreover, residents in social housing may prefer to have intimate contact with people who are spatially close to them or those with the same identity or hobbies. Surveyed residents reflected that the shorter the distance between them, the higher the frequency the contact would be. The social status and personal hobbies of neighbours may also have an influence on residents' interaction. No matter whether geographically near or far, respondents reflected much greater intimacy with the old Guangzhou residents than with the new Guangzhou residents. Surveyed people also appear to have a better connection with those who like community cultural activities. Nevertheless, female residents, people over 40 years old and less educated people (particularly those with no education at all) show greater dependence on the inner social environment of the community. In addition, a comparatively high income may positively affect personal contact with neighbours.

*Sense of community.* The majority of residents have good relationships with other people in the social housing community and they appear to be willing to be a member of the current community. In particular, residents aged over 40, with less education and lower income levels demonstrate greater emotional dependence on social housing communities.

This study defined sense of community in terms of two aspects: reciprocal exchange and individual recognition to the community. Reciprocal exchange entails the reciprocal care, conflict and corresponding solutions between people in the community. This may directly reflect the degree of intimacy and trust in the residential community. Most residents could interact harmoniously and communicate well in daily life. Thus, 55.0% of respondents felt that they live in harmony with neighbours, and 34.2% thought the interaction was quite good that they could solve common problems together. Nearly one-third of interviewees indicated that they were confronting hygiene and noise problems and issues caused by the moral character of their neighbourly relations. Half of them would like to deal these by themselves and 31.7% of them may ask for help from the local property company.

Individual recognition of the community is mainly about the feeling that one is a member of the community (belonging), and the willingness to live there long term (acceptance). Nine out of ten respondents had minimum contact of once per week. In accordance with the highly confirmed acceptance of the community, which reached 86.7%, we find that residents of social housing communities are very willing to live in the current community. Further, some factors may lead to greater acceptance on the part of residents, such as being over 40 years old, lower educational background, lower income and households who are confirmed by government as having low economic ability. The residents with these features not only display high acceptance of the community, but also demonstrate high dependence on relationships within the community. However, the willingness to live in social housing long term is much weaker among the following groups: younger people (less than 40 years old), more educated people (particularly those who have achieved an undergraduate education or higher) and people with higher incomes. The features of the community also lead to different levels of acceptance. Communities located in the western and northern clusters, and communities developed after 2008 have a higher percentage of residents with a willingness to live there long term. However, residents of communities which are middle size and fully mixed responded with lower intentions to live there long term. That is to say, a bigger percentage of them would be willing to move into a new residence in the future. Despite being

strongly dependent on the current community for daily communication, residents in middle-size or fully mixed communities appear to have lower acceptance of the current community.

*Social cohesion/social trust, social climate and residential satisfaction.* Residents in social housing have adapted to the new environment, particularly within the community. They have a positive attitude to integrating into the local environment, and it is highly possible that they will be accepted and incorporated by the surrounding people.

Social cohesion/social trust refers to a feeling of being trusted and being treated politely in terms of social behaviour. According to the varying degrees of intimacy, the survey separately investigated the strength of willingness to develop relationships. As a result, residents of social housing communities and residents of peripheral commercial housing communities have demonstrated a parallel and positive willingness to develop a mutual relationship with each other. In both groups the majority of respondents indicated a positive willingness to develop relationships with close friends, friends, neighbours and colleagues. The number of people who wanted to keep their distance or have no contact with the other group is much smaller. Social housing residents seem equally keen on any type of normal relationship such as with friends and neighbours, but residents of commercial housing communities prefer an ordinary relationship and are less enthusiastic about being very close friends. Hence, social housing residents have a positive attitude to integrating into the local environment, and surrounding people also have a positive attitude towards and accept social housing residents. Accordingly, there is a high possibility that residents in social housing will be accepted and incorporated by the surrounding people.

Social climate mainly focuses on the fear of crime, community problems and informal social control. In terms of responses to the experiences of unsafe occurrences in the past year, the social climate of the 13 surveyed social housing communities appears to be acceptable. An analysis of residential satisfaction examined whether the provision of services meets personal aspirations for housing design, community environment, community management, public services, neighbourly behaviour and potential job opportunities. The surveyed residents are quite satisfied with the housing design, particularly the ventilation, lighting and other such basic conditions. Surveyed residents also indicated that the majority of basic facilities provided for social housing communities (e.g. street lighting, inner public spaces, schools and nurseries and shops) are satisfactory. However, building quality, provision of medical facilities and management of the communities does not seemingly meet the psychological satisfaction of residents. When choosing an ideal community people mainly stressed convenience regarding travelling out; they therefore prefer to live in a community with convenient transport.

## 12.3 Implications and recommendations

This study included a theoretical review, a policy study, quantitative methods and qualitative analysis. To summarize the discussion in the theory section, the policy section and the empirical study, we would like to indicate the innovative aspects proposed by this study, as well as implications for future research and recommendations that may be helpful for practice.

### 12.3.1 Innovation in interpreting theories in the empirical study and implications

The first innovative point of this study is the way in which theoretical principles were interpreted in terms of topics for empirical study. In line with the historical evolution of spatial justice, this study reviewed the academic outcomes of justice from a political, moral, social and spatial perspective. A theoretical exploration of spatial justice proved fruitful, particularly the remarkable works of Edward Soja (2010a) and Peter Marcuse (2009b) (see Chapter 2.3.2.2). These studies are characterized by an emphasis on spatiality. There is no doubt that this perspective has advantages for exploring actual situations in terms of justice, but difficulties also result in establishing concrete criteria for measuring and fully interpreting envisaged opinions. With reference on their endeavours in enabling theoretical principles for empirical studies on spatial justice, this study tried to understand the major challenges in finding an appropriate way to structure spatial justice in an empirical study, and to define the needs in territorial distribution (see Chapter 2.3.3) and (in)justice in locational discrimination (see Chapter 2.3.4).

Informed by the dimensions framed in theories and the topics of focus in empirical research, our empirical analysis drew mainly on territorial distributive justice, economic justice and locational discrimination as expressed by spatial justice

theory. Then a threefold structure was formulated: territorial distributive justice with regard to goods demanded daily, economic inequality in the relationship between job and housing, and neighbourhood integration/exclusion in the local area (locational discrimination). The first two topics derive from territorial distributive justice and the third topic originates from consequent social phenomena caused by geographical location.

Past studies have widely discussed spatial justice from a theoretical perspective, or examined only one specific topic (e.g. distributive justice of healthcare) in an empirical study. However, these research studies may not be enough to respond whether the targeted group may suffer spatial justice when living in a certain place. Therefore, this study has made some efforts to provide a comprehensive explanation of this theory. This structure may therefore light the way for further empirical research on a defined population group.

Additionally, this study also proposed an index system for studying neighbourhood integration (see Chapter 10). By summarizing past research on related topics of integration, neighbourhood integration here contains the concepts of social participation, social communication, sense of community, social cohesion and residential satisfaction. A review of past studies and the newly formed structure may also serve to provide some ideas for future research.

### **12.3.2 Innovative methods and implications for further research**

In exploring access to facilities and the job–housing relationship, this study combined methods of spatial analysis and mathematical statistical analysis to define the situation. The combined analysis may offer more information, not only about the geographical features, but also with regard to the real situation experienced by individuals. Particularly in the study of the accessibility of facilities, we calculated the service area using such as approaches overlay analysis based on a route system, and we computed the accessible resources of medical facilities and middle schools using the tool of the two-step floating catchment area (2SFCA). We also drafted the movement of workplaces using the tool of spider analysis. All these spatial analyses were completed using the platform ArcGIS. Furthermore, our research also considered personal needs. In every topic, we added satisfaction assessment when identifying physical phenomena. With both the results of the physical situation and the individual satisfaction assessment, we tried to ascertain whether they were experiencing justice or injustice. The application of these methods may add some capabilities for related research topics.

### **12.3.3 Implications for practice**

With regard to inconvenience in accessing facilities, it is important to improve the service quality of basic healthcare and the quality of education in the areas surrounding social housing. Residents of social housing may have no significant difficulties to reaching such services geographically, but the accessible facilities may not provide them with good quality. Therefore, the injustice they are suffering related to the quality rather than the quantity of the service. When constructing new social housing communities, more attention should be given to the quality of services, particularly the basic healthcare and education, especially around Tianhe, Baiyun district and new projects.

To reduce the specific injustices that social housing residents are confronted with, strengthening these aspects would be very helpful in providing fair and equitable or just services for residents of social housing communities. The prime work in addressing injustice among social housing residents in terms of access to facilities should focus on the issues experienced by specific communities. In addition, it is important to improve the quality of basic healthcare services, the quality of education and price levels of commercial goods in the communities in Tianhe and Baiyun. In addition, despite no clear injustice in accessing shopping malls, parks and metro stations, there are often inconveniently situated for residents of social housing. Therefore improving these services in social housing community areas (particularly Baiyun district) would be very helpful for reducing disparity among residents.

With regard to the problem of inconvenient connections between job and housing, we know that employed residents may not experience serious problems of social injustice in reaching workplaces as they are mainly engaged in jobs in basic services with low-skill requirements. In addition, the areas surrounding the communities have many job opportunities in basic services. Therefore, it would be helpful to provide more industries involved in basic services, such as the catering industry, in these areas.

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- Mr. LIANG.: Resident of Affordable Housing: JUDE Residential Neighborhood: expert interview on January 23rd, 2013
- Mr. LIANG.: Resident of Low-rent Housing: JUDE Residential Neighborhood: expert interview on January 15th, 2013
- Mr. LUO.: Resident of Affordable Housing: FANGHE Residential Neighborhood: expert interview on January 23rd, 2013
- Mr. YE.: Chief of the Project Preparation Department: expert interview on January 23rd, 2013
- Mr. ZHANG.: Resident of Low-rent Housing: JUDE Residential Neighborhood: expert interview on January 15th, 2013
- Ms. CHEN.: Resident of Affordable Housing: JUDE Residential Neighborhood: expert interview on January 15th, 2013
- Ms. LI.: Resident of Low-rent Housing: FANGHE Residential Neighborhood: expert interview on January 21st, 2013
- Ms. LIU.: Chief of the General Department: expert interview on January 22nd, 2013
- Ms. TANG.: Resident of Early Social housing in 1990s: JUDE Residential Neighborhood: expert interview on January 25th, 2013
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- Ms. XU.: Resident of Affordable Housing: JUDE Residential Neighborhood: expert interview on January 15th, 2013
- Ms. YUE.: Resident of Affordable Housing: JUDE Residential Neighborhood: expert interview on January 15th, 2013
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- Ms. ZHOU.: Resident of Affordable Housing: TANGDE Residential Neighborhood: expert interview on January 25th, 2013
- TAN, G.: Resident of Low-rent Housing: TANGDE Residential Neighborhood: expert interview on January 25th, 2013
- WANG, D.: Leader of JUDE Residential Neighborhood Property Management Company: expert interview on January 11st, 2013
- WANG, D.: Leader of JUDE Residential Neighborhood Property Management Company: personal communication during the field trip in Guangzhou China, January to February 2013
- WU, W.: Resident of Affordable Housing: JINSHAZHOU Residential Neighborhood: expert interview on January 13st, 2013
- YI, M.: Vice director of the Housing Management Department: expert interview on January 22nd, 2013
- YUAN, Y.: Professor of the Department of Urban and Regional Planning, Sun Yat-sen University: expert interview on January 16th, 2013
- ZHANG, D.: Staff of JUDE Residential Neighborhood Property Management Company: personal communication during the field trip in JUDE Residential Neighborhood, Guangzhou China, January 15th, 2013
- ZHOU, X.: Leader of FANGHE Residential Neighborhood Work Station: expert interview on January 21st, 2013
- ZHU, C.: Resident of Low-rent Housing: TANGDE Residential Neighborhood: expert interview on January 25th, 2013



## Appendices

### A.1 The list of policies regarding social housing

Tab. A.1.1 The list of policies of the national government and the Guangdong province (Chapter 5.2.2 Official documents: p. 116)

Time	Number	Issued department	Policy title	Main points
1990.9	建房字[1990]446		Notification of issue on solving housing problems of special difficult residents	
1991.6		State Council	Notification of continuous, active and stable housing institution reform	<ul style="list-style-type: none"> <li>• Advocate development of affordable housing</li> </ul>
1993.8	建房字[1993]598	Ministry of Construction and other 5 departments	Strengthen estate market management, promoting estate industry sustainable development	<ul style="list-style-type: none"> <li>• Give the meaning of definition of affordable housing firstly</li> </ul>
1994.7		State Council	The State Council on Deepening the Reform of Urban Housing Institution	<ul style="list-style-type: none"> <li>• Accelerate affordable housing development</li> </ul>
1994	761	Ministry of Construction	Administrative measures of affordable housing construction	<ul style="list-style-type: none"> <li>• Describe the targeted group, land arrangement, construction mode and administrative structure</li> </ul>
1995		State Council	National embodiment of ANJU project	<ul style="list-style-type: none"> <li>• Start formally construction of ANJU housing as the main type of affordable housing</li> </ul>
1998.7	23	State Council	Notification on deepen of housing institution reform and construction	<ul style="list-style-type: none"> <li>• Decide to build up affordable housing-dominant multi-level supply system</li> <li>• Present concept of low-rent housing at first time</li> </ul>
1999.4	70	Ministry of Construction	Administrative measures of town low-rent housing	<ul style="list-style-type: none"> <li>• Interpretation on low-rent housing</li> <li>• Rule the source, rent, area and application of low-rent housing</li> </ul>
2003.12	120	Ministry of Construction and other 5 departments	Administrative measures of town lowest income family and low-rent housing	<ul style="list-style-type: none"> <li>• Widely pursue low-rent housing institutional system</li> </ul>
2004.5		Ministry of Construction	Administrative measure of affordable housing	<ul style="list-style-type: none"> <li>• Clarify the connotation of affordable housing</li> <li>• Rule measures on emerged problems (especially the enter standard management), strengthen administration of affordable housing</li> </ul>
2005.3		National Development and Reform Commission & Ministry of Construction	Administrative measures on town low-rent housing rent	<ul style="list-style-type: none"> <li>• Set the roles of government in low-rent housing administration</li> <li>• Strengthen management and supervision</li> <li>• Adjust the rent standard</li> </ul>
2005.10		Ministry of Construction & Ministry of Civil Affairs	Administrative measures on low-rent housing application, examination and exit	<ul style="list-style-type: none"> <li>• Formulate detailed guidance on application, enter and exit procedures</li> </ul>

2006.7	国办发[2006]37	Office of State council	Notification of modulation housing supply system for stabilize housing price	<ul style="list-style-type: none"> <li>• Prioritize the development of low-rent housing</li> <li>• All of cities set up low-rent housing system before 2006</li> </ul>
2007.8	国办发[2007]24	State Council	Several opinions on solving urban low income family housing problems	<ul style="list-style-type: none"> <li>• Stress the importance of Social housing construction</li> <li>• Put forward low-rent housing-dominant Social housing system, affordable housing as auxiliary force</li> <li>• Broaden the targeted group of low-rent housing</li> <li>• Elaborate on guarantee range, guarantee mode, finance source, construction standard and so on</li> <li>• Concept of affordable housing</li> </ul>
2007.10	建住房[2007]258	Ministry of construction and other 7 departments	New Administrative measure of affordable housing	<ul style="list-style-type: none"> <li>• Concept of affordable housing</li> </ul>
2007.11	建设部令 162	Ministry of construction and other 9 departments	Guarantee measures of low-rent housing	<ul style="list-style-type: none"> <li>• Normalize the management of low-rent housing</li> </ul>
2007.10	财综[2007]64	Ministry of Finance	Administrative measures of low-rent housing finance	<ul style="list-style-type: none"> <li>• Normalize the finance management of low-rent housing</li> </ul>
2007.10	财综[2007]57	Ministry of Finance	Measures for the implementation of special subsidy finance	<ul style="list-style-type: none"> <li>• Strengthen financial management of low-rent housing construction</li> </ul>
2008.1	粤府办[2008]3	Guangdong Provincial government	Implementation opinion of Guangdong provincial government on solving housing problems of low-income family	
2008.3	建保[2008]62	Ministry of Construction	Reinforce the management on low-rent housing quality	
2009.6	建保[2009]91	Ministry of Construction	Notification of issue of 2009-2011 planning of low-rent housing	<ul style="list-style-type: none"> <li>• Accelerate the procedure of low-rent housing-dominant Social housing system</li> </ul>
2010	建保[2010]59	Ministry of Construction	Notification of strengthen affordable housing administration	•
2010	建保[2010]62	Ministry of Construction	Notification of strengthen low-rent housing administration	•
2010.6	建保[2010]87	Ministry of construction and other 7 departments	Instruction of accelerating public-rental housing construction	<ul style="list-style-type: none"> <li>• Set up the principle of public-rental housing administration</li> </ul>
2010.12	粤府办[2010]65	Guangdong Provincial government	Notification of issue of implementation opinion on strengthen public-rental housing	•
2012.5	11	Housing and Urban-rural construction department	Administrative measures on public-rental housing	<ul style="list-style-type: none"> <li>• Give the concept of public-rental housing</li> </ul>
2012	粤府办[2012]12	Guangdong Provincial government	Creative measures on Guangdong Social housing system	<ul style="list-style-type: none"> <li>• Put forward public-rental housing-dominant supply structure</li> </ul>

Tab. A.1.2 Documents of Guangzhou local government

Time	Number	Issued department	Policy title
1986	穗府[1986]56	Guangzhou Government	Scheme of solving housing problems of Guangzhou residents with inhabitant area less than 2 m <sup>2</sup>
1998		Guangzhou Government	Implementation embodiment of Guangzhou Low-rent housing
1999.9	穗国房字[1999]201	Guangzhou Government	Notification of JIEKUN housing transaction in market
2003.3	穗府[2003]184	Guangzhou Government	Notification of launching of low-rent housing construction work
2004.5	建住房[2004]77	Guangzhou Bureau of Land Resource and Housing	Administrative measures of affordable housing
2007.12	穗府[2007]48	Guangzhou Government	Embodiment of Guangzhou affordable housing institution (Trail)
2007.12	穗府[2007]48	Guangzhou Government	Embodiment of Guangzhou low-rent housing institution (Trail)
2008.3	穗放改住建[2008]18	Guangzhou Government	Notification of accomplishing Guangzhou affordable housing qualification examination work, 2008
2008.1	穗府[2008]1	Guangzhou Government	Administrative measures on Guangzhou Price-capped housing sales
2009.9	穗住保[2009]85	Guangzhou Government	Notification of strengthen of Guangzhou Social housing qualification examination and supervision works
2009.2	穗住保[2009]15	Guangzhou Government	Notification of accomplishing supervision work after subsidy distribution
2009.11	穗住[2009]124	Guangzhou Government	Measures on land reservation of Social housing
2010.5	穗住保[2010]65	Guangzhou Government	Regulations of Social housing residential neighborhood penalty (Trail)
2010.5	穗住保[2010]63	Guangzhou Government	Notification of implementation of improving income upper line of low-rent housing guarantee
2010.7	穗住[2010]112	Guangzhou Government	Measures of accepting public supervision on Guangzhou housing work (Trail)
2010.1	穗住保 [2010]8	Guangzhou Government	Notification of carrying out of low-rent housing annual examination
2010.2	穗住保 [2010]31	Guangzhou Government	Notification of affordable housing re-check problems in application
2010.5	穗住保[2010]67	Guangzhou Government	Guidance of collecting market-rental housing as low-rent housing source, 2011
2011	穗住保[2011]49	Guangzhou Government	Engineering construction technical guidance of Guangzhou Social housing(trail)
2011.9	穗住[2011]152	Guangzhou Government	Notification of inspecting situation of low income family
2011.6	穗住保[2011]84	Guangzhou Government	Notification of application extending of affordable housing purchase permit
2012.8	穗住[2012]122	Guangzhou Government	Notification of implementation of improving income upper line of low-rent housing guarantee
2012.5	穗住保[2012]73	Guangzhou Government	Notification of strengthen qualification examination work
2012.3	穗住保[2012]38	Guangzhou Government	Notification of accomplishing first turn distribution work of low-rent housing
2012.5	穗住保[2012]65	Guangzhou Government	Notification of issue on “2012 Social housing distribution planning”

2012.7	穗住[2012]101	Guangzhou Government	Notification of accomplishing second turn distribution work of low-rent housing
2013.5	穗府办[2013]3	Housing Office of Guangzhou city	Implement measures of Guangzhou public-rental housing guarantee institution (Trail)
2013.4	穗住保[2013]49	Housing Office of Guangzhou city	Enforcement regulation of Guangzhou public-rental housing waiting procedure
2013.4	穗住保[2013]39	Housing Office of Guangzhou city	Notification of suspend affordable housing application
2013		Housing Office of Guangzhou city	Regulations of Social housing residential neighborhood penalty
2014.2	穗住保[2014]13	Housing Office of Guangzhou city	Enforcement regulation of Guangzhou public-rental housing examination on application

## A.2 Questionnaire

### A.2.1 Questionnaire in English



May we ask, if you presently live in a social housing community?

#### Questionnaire code:

### The research on requirements of residents in Guangzhou social housing

#### Dear residents:

More than 100 thousand local residents have been moved into small or large social housing communities in recent years. In order to find out about their experiences, especially regarding the degree of life convenience and social integration, a special research group of the School of Geography and Planning of Sun Yat-sen University has set up this questionnaire.

The questions include daily life space, neighborhood communication, and social satisfaction.

You are the one of 600 interviewees who has been selected by a random sampling method among 150 thousand residents, your answers are of utmost importance for our research. You will also contribute to the government's design of related policies and improvement of the communities.

The questionnaire is anonymous. If possible, please provide a contact (phone, QQ or E-mail), in order for us to conveniently get back to you. Your personal information will be strictly protected according to the National Statistics Law! The answers to all questions in the questionnaire are neither right nor wrong. We hope you will answer each question truthfully and seriously and express your real feelings and views without any apprehensions.

It will take about 20 minutes to complete the questionnaire. In order to thank you for your active participation you will receive 20 Yuan in recompense after completion of the questionnaire.

With sincere thanks for your support and cooperation and best wishes to you and your family!

School of Geography Science and Planning, Sun Yat-sen University

August 2013

(To be filled in by interviewer)

Date	2013 ___(month) ___(date)	Code of research group	
Questionnaire Time	Start: ___(hour)___(minute) End: ___(hour)___(minute)	Name of interviewer	
Questionnaire Location	___(district)___(name of community)___(section)	Supervisor	

#### Explanations:

- (1) Our respondents are all social housing community residents over 18 years old (possibly main house resident or their partner). Each household should only fill in one questionnaire.
- (2) Please mark the most suitable answer with a "✓" and do not omit any answer. If there is no suitable answer to a question, you can indicate your specific situation in the blank space below the question.
- (3) Please ask for the interviewer's help, if you encounter any problems while filling in the questionnaire.

#### Part 1 Work situation

**A1 Are you employed or do you have your own business at present (including temporary job)?**

1 Yes (please go to question A3) 0 No (please go to question A2)

**A2 What is the reason you are presently unemployed or have no business?**

1 retirement 2 illness 3 family restrictions (e.g. care work) 4 a job is hard to find 5 unwilling to work 6 other

**Please go to question A18****A3 What kind of employment do you have?**

1 long-term contract worker 2 short-term contract worker 3 informal work 4 self-employed 5 collective business 6 other

**A4 How did you find your present job?**

1 community announcement 2 neighbors' introduction 3 friends' recommendation 4 by myself (e.g. through Internet)

5 with the governments' help 6 community job fair 7 other

**A5-A6 Your current place of work:** \_\_\_\_\_(district)\_\_\_\_\_ (street)**A7 Which means of transportation do you use to go to work?**

1 by foot 2 by bicycle 3 by public transportation (including company shuttle bus) 4 by electric bicycle 5 by car 6 other

**A8 How long does it take for a single commute?**

① &lt;15min ② 15-30min ③ 30-60min ④ 1-1.5h ⑤ 1.5-2h ⑥ &gt;2h

**A9 How much do you pay for transportation per month?**

① &lt;50 yuan ② 50-100 yuan ③ 100-150 yuan ④ 150-200 yuan ⑤ &gt;200 yuan

**A10 Have you changed your job since moving into social housing?**

1 yes (go to question A11) 0 no (Please go to question A23)

**If you chose "yes" in A10, please continue with A11****A11 How did you change your job? Choose one suitable answer among the below-mentioned possibilities:**

1 change of working place, not change of job 2 change of working place and type of work 3 change of the type of work, no change of working place 4 no change at all

**A12-A14 If you changed the place of work, what is the reason? (You can choose three answers at most)**

1 distance between working place and home is too big 2 inconvenient transportation between home and place of work 3 higher income at new place of work 4 more work opportunities at new working place 5 better interpersonal relationships at new place of work 6 informal job with frequent changes of working place 7 other

**A15-A17 If you changed the type of work, what is the reason? (You can choose three answers at most)**1 higher income with the new type of work 2 more friends in the new job environment 3 acquired new skills  
4 interested in the new type of work 5 informal job, unstable job environment 6 family restrictions (e.g. care work)  
7 expiration of contract 8 fired 9 other**A18-A19 What is the work place of your former or last job?** \_\_\_\_\_ (district)\_\_\_\_\_ (street) (Please fill in "9999" and go to question A31 if you have no job)**A20 Which means of transportation did you use for going to work?**

1 by foot 2 by bicycle 3 by public transportation (including company shuttle bus) 4 by electric bicycle 5 by car 6 other

**A21 How long did it take for a single commute?**

① &lt;15min ② 15-30min ③ 30-60min ④ 1-1.5h ⑤ 1.5-2h ⑥ &gt;2h

**A22 How much did you pay for transportation per month?**

① &lt;50 yuan ② 50-100 yuan ③ 100-150 yuan ④ 150-200 yuan ⑤ &gt;200 yuan

**Please go to question A31****If you answered A10 with „no“, please continue with A23****A23 Do you intend to change your place of work?**

1 yes 0 no (please go to question A31)

**A24-A26 Why do you want to change the current place of work? (You can choose three answers at most)**

1 distance between working place and home too big 2 inconvenient transportation between home and place of work 3 higher income at new place of work 4 more work opportunities at new place of work 5 better interpersonal relationships at new place of work 6 informal job with frequent changes of working place 7 other

**A27 Do you intend to change the type of work?**

1 yes 0 no (please go to question A31)

**A28-A30 Why do you want to change the type of work? (You can choose three answers at most)**

1 higher income with the new type of work 2 more friends in the new job environment 3 acquired new skills 4 interested in the new type of work 5 informal job, unstable job environment 6 family restrictions (e.g. care work) 7 expiration of contract 8 other

**A31 What do you think of the quantity and quality of work opportunities around the community?**

1 very few 2 few 3 normal 4 many 5 quite many

**Part 2 Accessibility of service facilities**

**B1-B9 How do you reach the following facilities? (Choose the most frequently used)**

	by foot			by bicycle			by electric bicycle			by public transportation			by car		
	<20 min	20-40min	>40 min	<20 min	20-40 min	>40 min	<20 min	20-40 min	>40 min	<20 min	20-40 min	>40 min	<20 min	20-40 min	>40 min
B1 Medical facilities	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B2 Nursery and elementary schools	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B3 Middle schools	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B4 Meat and food markets	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B5 Convenience supermarkets	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B6 Shopping malls	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B7 Nearest park	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B8 Nearest bus station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B9 Nearest metro station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

**Part 3 Justice recognition**

**C1-C19 From your perspective, which conditions or requirements are reasonable for achieving justice?**

Are the following requirements reasonable in achieving	very reasonable	reasonable	normal	unreasonable	very unreasonable
C1 The applicant must have a HUKOU of Guangzhou city	5	4	3	2	1
C2 The applicant must openly and truthfully show family assets and income levels	5	4	3	2	1
C3 The applicants' family income must be lower than the upper limit set by the government	5	4	3	2	1
C4 The application needs to be examined and made public several times	5	4	3	2	1
C5 The entry order of the applicant needs to be determined according to the rating policy	5	4	3	2	1
C6 The applicant's housing location is determined by a raffling method ( <i>durch Verlosung</i> )	5	4	3	2	1
C7 The applicant's housing preferences will be considered	5	4	3	2	1
C8 The applicant has to move out, if he/she doesn't conform with the housing conditions	5	4	3	2	1
C9 The applicants can equally use the public facilities of the community	5	4	3	2	1
C10 The applicant must obey the community regulations (e.g. deduction policy etc.)	5	4	3	2	1
C11 There is no big difference to other city dwellers between the distance of the applicant's housing and the place of work	5	4	3	2	1
C12 There is no big difference to other city dwellers between the distance of residence and the city's major public resources	5	4	3	2	1
C13 There is a satisfactory public transportation system outside the applicant's residential area	5	4	3	2	1
C14 There are satisfactory education facilities in the vicinity of the applicant's residential area	5	4	3	2	1
C15 There are satisfactory medical facilities in the vicinity of the applicant's residential area	5	4	3	2	1
C16 There are satisfactory entertainment and leisure spaces in the applicant's residential area	5	4	3	2	1
C17 The applicant's housing quality is up to standard	5	4	3	2	1
C18 The applicant's housing space meets the demands of the household	5	4	3	2	1
C19 The applicant's housing design is reasonable and comfortable	5	4	3	2	1

**Part 4 Neighborhood communication**

**D1-D10 How often do you contact with following groups?**

	very often	often	normal	rarely	never
D1 people in the same building	5	4	3	2	1
D2 people in the same community	5	4	3	2	1
D3 people in the neighboring communities	5	4	3	2	1
D4 people of my former old community	5	4	3	2	1
D5 old Guangzhou residents	5	4	3	2	1
D6 new Guangzhou residents	5	4	3	2	1
D7 low-rent community housing residents	5	4	3	2	1
D8 community economic housing residents	5	4	3	2	1
D9 people who love community cultural activities	5	4	3	2	1
D10 volunteers of social welfare activities	5	4	3	2	1

**D11 How many friends do you have in your community?**

- ① none ② 1-4 ③ 5-9 ④ 10-20 ⑤ >20

**D12 Did you make new friends with other households after moving into the new social housing community?**

- ① none ② 1-4 ③ 5-9 ④ 10-20 ⑤ >20

**D13 How often do you contact your new friends?**

- ① less than once a month ② 2-3 times a month ③ once a week ④ 2-3 times a week ⑤ every day

**D14-D16 How did you get to know these new neighbors? (You can choose three answers at most)**

- 1 shopping 2 children's education 3 public community activities 4 online community discussions 5 friends' introduction 6 other

**D17 What do you think of the mutual care between neighbors in the social housing community?**

- 1 very bad 2 bad, people are indifferent 3 so-so, we get along harmoniously, but don't have frequent contact 4 quite good, we solve common problems together 5 very good, we help each other

**D18-D20 What do you think are the main conflicts between the residents of the social housing community? (You can choose three at most)**

- 1 different work and resting time, noise problems 2 different hygiene habits 3 keeping pets 4 occupying public space for private use 5 parking lot 6 different viewpoints 7 different moral characters 8 other

**D21-D23 Which solution do you often use when encountering conflicts with your neighbors? (You can choose three answers at most)**

- 1 settle by leaving it unsettled 2 both parties adjust themselves 3 look for other residents to help 4 look for the property company to help 5 ask the neighborhood committee to mediate 6 go to the municipal level to explain the situation 7 tell the media 8 other

**Part 5 Social participation and social trust**

**E1-E9 How often do you contact the following organizations?**

	very often	often	normal	rarely	never
E1 Social housing office of Guangzhou	5	4	3	2	1
E2 Guangzhou municipal civil affairs bureau	5	4	3	2	1
E3 District street office	5	4	3	2	1
E4 District neighborhood committee	5	4	3	2	1
E5 Property company	5	4	3	2	1
E6 Local police station	5	4	3	2	1
E7 District volunteers' organization	5	4	3	2	1
E8 District owner ( <i>Eigentümer</i> ) committee	5	4	3	2	1
E9 Media	5	4	3	2	1

**E10-E17 Do you participate in the following community activities?**

	every time	often	sometimes	rarely	never
E10 Election of the community neighborhood committee	5	4	3	2	1
E11 Election of the community owner committee	5	4	3	2	1
E12 Cultural activities of the community center (studies of interest and skills etc.)	5	4	3	2	1
E13 Recreational activities of the community center (singing, dancing etc.)	5	4	3	2	1
E14 Community volunteering activities (helping others)	5	4	3	2	1
E15 Spontaneous community donation activities	5	4	3	2	1
E16 Outdoor leisure activities (morning exercises, fitness etc.)	5	4	3	2	1
E17 Discussions on community building issues online or in meetings	5	4	3	2	1



**E18-E22 Have you made the following experiences during the past year?**

	yes	no
<b>E18</b> Been beaten up by others	1	0
<b>E19</b> Been cheated of property by others	1	0
<b>E20</b> Been stolen by others	1	0
<b>E21</b> Been threatened by others	1	0
<b>E22</b> Been robbed by others	1	0

**Part 6 Community interaction**

**F1 Do you often visit peripheral commercial housing districts?**

1 never 2 occasionally 3 about once a month 4 about once a week 5 very often, almost every day

**F2 Why do you visit peripheral commercial housing districts?**

1 to chat with friends, leisure 2 work requirement 3 to visit or help friends 4 to participate in their community activities 5 other

**F3-F5 What are the reasons you do not like to visit peripheral commercial housing districts? (You can choose three answers at most)**

1 different social background 2 no time 3 no need of visiting 4 restrictive community management 5 different community hygiene  
6 other

**F6 Have residents of the commercial housing districts had cooperation on social activities with your district?**

1 never 2 very seldom, once to twice a year 3 sometimes, once to twice a month 4 often, about once to twice a week 5 very often, almost every day

**F7 Do surrounding commercial housing residents actively communicate with you? 1 yes 0 no**

**F8 Do you actively communicate with surrounding commercial housing residents? 1 yes 0 no**

**F9 Do you trust the surrounding commercial housing community residents?**

1 absolutely not 2 not really 3 so-so 4 yes 5 yes, a lot

**F10 Do you have difficulties communicating with surrounding commercial housing residents? 1 yes 0 no**

**F11-F13 What do you believe are the reasons for difficulties in communication with surrounding commercial housing residents? (You can choose three answers at most)**

1 different viewpoints 2 language problems 3 living habits 4 different social status 5 different moral character 6 no contact opportunities 7 other

**F14 Do you have relatives or friends living in the surrounding commercial housing districts? 1 yes 0 no**

**F15 Did you ask them for help when you encountered difficulties after moving in?**

1 never 2 occasionally 3 often

**F16 Did your communication increase or decrease after moving in?**

1 substantially decreased 2 decreased 3 no change 4 increased 5 substantially increased

**F17-F19 What is the reason for the change in communication frequency? (You can choose three answers at most)**

1 change in the distance between the housing 2 difference in community identity 3 change of viewpoints 4 difference in district management  
5 district environmental hygiene 6 district security 7 other

**Part 7 Social identity**

**G1 From your perspective, you are a**

1 old Guangzhou resident 2 new Guangzhou resident 3 new community resident 4 resident from outside of Guangzhou 5 other

**G2 After moving in, how many surrounding commercial housing district residents did you get acquainted with?**

① none ② <10 ③ 10-20 ④ 20-50 ⑤ >50

**G3-G8 To which degree are you willing to communicate with residents of surrounding commercial housing districts?**

	very willing	willing	no idea	unwilling	unimaginable
<b>G3</b> you would like to be close friends	5	4	3	2	1
<b>G4</b> you would like to be friends	5	4	3	2	1
<b>G5</b> you would like to be neighbors	5	4	3	2	1
<b>G6</b> you would like to be colleagues	5	4	3	2	1
<b>G7</b> you would like to keep distance	5	4	3	2	1
<b>G8</b> you would like no contact	5	4	3	2	1

**G9 Do you think there is a difference between social housing communities and normal commercial housing districts?**

1 a big difference 2 a certain difference 3 a small difference 4 no difference 5 no idea

**G10-G12 If you think there is a difference, in which areas is this mainly reflected? (You can choose three answers at most)**

1 location 2 facilities within the district 3 building quality 4 district environmental hygiene 5 access management (*Zugangsberechtigung*)  
6 household background 7 government investment 8 other

**Part 8 Degree of social satisfaction**

**H1-H19 Are you satisfied with the following community aspects?**

	very satisfied	satisfied	so-so	dissatisfied	very dissatisfied
<b>H1</b> Indoor ventilation	5	4	3	2	1
<b>H2</b> Indoor lighting	5	4	3	2	1
<b>H3</b> Corridor space	5	4	3	2	1
<b>H4</b> Quietness of environment	5	4	3	2	1
<b>H5</b> Building quality	5	4	3	2	1
<b>H6</b> Housing space	5	4	3	2	1
<b>H7</b> Housing design	5	4	3	2	1
<b>H8</b> Street lighting	5	4	3	2	1
<b>H9</b> Public space within the community (e.g. green space, fitness machines)	5	4	3	2	1
<b>H10</b> Property management	5	4	3	2	1
<b>H11</b> Public services in the community	5	4	3	2	1
<b>H12</b> Security	5	4	3	2	1
<b>H13</b> Schools and nurseries	5	4	3	2	1
<b>H14</b> Medical facilities	5	4	3	2	1
<b>H15</b> Shopping facilities	5	4	3	2	1
<b>H16</b> Neighborhood relations in the community	5	4	3	2	1
<b>H17</b> Degree of integration with surrounding communities	5	4	3	2	1
<b>H18</b> Work opportunities in the vicinity	5	4	3	2	1
<b>H19 Overall evaluation</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>

**H20-H40 Please mark on scale to show your satisfaction on following facility.**

e.g. district fitness installations		very abundant	5	4	3	2	1	very deficient
Medical facilities	H20	very near	5	4	3	2	1	very far
	H21	very comprehensive	5	4	3	2	1	very simple
	H22	very reliable	5	4	3	2	1	very unreliable
Nursery and elementary schools	H23	very near	5	4	3	2	1	very far
	H24	very adequate teachers	5	4	3	2	1	very inadequate teachers
	H25	very high quality	5	4	3	2	1	very inferior quality
Middle schools	H26	very near	5	4	3	2	1	very far
	H27	very adequate teachers	5	4	3	2	1	very inadequate teachers
	H28	very high quality	5	4	3	2	1	very inferior quality
Food markets	H29	very near	5	4	3	2	1	very far
	H30	very rich supply	5	4	3	2	1	very insufficient supply
	H31	very cheap	5	4	3	2	1	very expensive
Convenience supermarkets	H32	very near	5	4	3	2	1	very far
	H33	very rich supply	5	4	3	2	1	very insufficient supply
	H34	very cheap	5	4	3	2	1	very expensive
Shopping malls	H35	very near	5	4	3	2	1	very far
	H36	very cheap	5	4	3	2	1	very expensive
Public transport stations	H37	very near	5	4	3	2	1	very far
	H38	very abundant	5	4	3	2	1	very few
	H39	very smooth access	5	4	3	2	1	very crowded
Overall evaluation	H40	very satisfied	5	4	3	2	1	very dissatisfied

Means you think the quantity of fitness machines in the community is "quite deficient"

**H41-H43 According to your view, please choose the three possibly most ideal social housing districts:**

H41 \_\_\_\_\_ district; H42 \_\_\_\_\_ district; H43 \_\_\_\_\_ district

- 1 Jude community 2 Tangde community 3 Zede community 4 Jide community 5 Jinshazhou community 6 Fanghe community 7 Dang'en community 8 Guangdan community 9 Longgui community 10 Luogang central district community 11 Teacher Housing community (Yunlong, Yulongju etc.) 12 Guocun community 13 Wansong community 14 Tai'an community 15 Xincun project 16 Maofangchang project 17 Anxia community 18 Hengyuan community 19 Miaohe community 20 Huize Yaxuan community

**H44-H48 What were the five priority factors when choosing your ideal district? Please fill in according to the rank of priority.**

H44 \_\_\_\_\_; H45 \_\_\_\_\_; H46 \_\_\_\_\_; H47 \_\_\_\_\_; H48 \_\_\_\_\_

- 1 location is near to the city 2 convenient to go to work 3 convenient transportation 4 surrounding public service facilities are sufficient 5 good community property management 6 abundant education resources 7 sufficient medical facilities 8 good commercial environment 9 enough work opportunities 10 good housing quality 11 appropriate price of water and gas 12 sufficient green areas in the district 13 sufficient space for public activities within the district 14 ratio between low-rent housing and economic social housing 15 spatial arrangement between different types of social housing 16 other

**H49 Would you like to live here long-term?** 1 yes 0 no

**H50-H52 If you intend to move, what is the reason? (You can choose three answers at most)**

- 1 remote location 2 too many social housing communities 3 bad traffic environment 4 insufficient public service facilities (education, medical facility etc.) 5 lack of job opportunities 6 other

**Part 9 Household information (please fill the corresponding number into the blank space underneath the question)**

	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11
	Relationship with the owner	Gender	Age	Marital status	Educational background	Family structure	HUKOU	In which year did you get your local HUKOU?	Is your HUKOU in the social housing district?	Why haven't you changed your HUKOU?	Type of family
	1. Owner 2. Spouse 3. Son or daughter 4. Parent 5. Grandparent 6. Grandchild 7. Brother or sister 8. Not direct relative 9. Other	1. Male 2. Female		1. Single 2. Married 3. Divorced or widowed	1. No education 2. Primary school 3. Middle school 4. High school or technical secondary school 5. Undergraduate study or junior college 6. Graduate studies and above 7. Other	1. One-person family 2. Nuclear family (two generations, a couple and single children) 3. Immediate family (3 generations and above) 4. Composite family 5. Other	1. Local urban HUKOU 2. Local rural HUKOU 3. Outside urban HUKOU 4. Outside rural HUKOU	(Please fill in "9999" if you have a local HUKOU from birth )	1. Yes 0. No	(please fill in "9999" if you have moved it ) 1. For better education of offspring 2. For better medical service 3. For better social security 4. I don't stay here normally 5. The work of the district neighborhood committee is poor 6. Other	1. Low-income 2. Low insurance household 3. Poor household 4. Widowed elderly, disabled, veterans' relatives etc. 5. Common families 6. other
For interviewee											

I12-I13	I14	I15	I16	I17	I18	I19	I20	I21-I23	I24-I29	I30	I31	I32
Date of moving in	Type of housing	Housing units	Floor	Housing area (m <sup>2</sup> )	Number of persons in household	Rent (Yuan)	Reason for facing withdrawal	History of housing migration	Social security	Occupation	Monthly family income (Yuan)	Monthly family expenses (Yuan)
(e.g.: 2008.12)	1. Low-rent housing 2. Public rental housing 3. Affordable housing 4. Capped-price housing 5. Resettlement housing 6. Commercial housing 7. Not yet transferred ANJU and JIEKUN housing 8. Already transferred ANJU and JIEKUN housing 9. Other	1. One bedroom, one living room 2. Two bedrooms, one living room 3. Two bedrooms, two living rooms 4. Three bedrooms, two living rooms 5. Other				(please fill in "9999", if you don't need to pay rent) To be filled in by public rental tenants, including low-rent housing (monthly rent per m <sup>2</sup> , f.i. 1 Yuan/m <sup>2</sup> per month)	(please fill in "9999", if you don't have this problem) 1. Children's' graduation 2. Retirement 3. Family income exceeds requirement 4. Violation of rules 5. Other	Former location before moving into social housing	(you can choose multiple answers) <b>I24</b> pension <b>I25</b> health insurance <b>I26</b> unemployment insurance <b>I27</b> work-related injury insurance <b>I28</b> housing fund <b>I29</b> hardship subsidies	(Please refer to Code 1 below) Add the corresponding number in the blank space	1. <500 2. 500-999 3. 1000-1999 4. 2000-2999 5. 3000-3999 6. 4000-4999 7. 5000-5999 8. 6000-6999 9. >7000	1. <500 2. 500-999 3. 1000-1999 4. 2000-2999 5. 3000-3999 6. 4000-4999 7. 5000-5999 8. 6000-6999 9. >7000
								_____city _____district _____street				

Code 1: 1. farm worker 2. security management 3. housekeeping 4. catering services 5. wholesale and retail 6. maintenance management 7. other service trades (e.g. hairdresser, cosmetics, restaurant waiter, driver etc.) 8. factory worker 9. construction worker 10. craftsman 11. business personnel 12. business management personnel 13. full-time professional (teacher, doctor, etc.) 14. responsible for government and civil servant 15. other

**Part 10 Personal health information**

J1 Your height \_\_\_\_\_ cm

J2 Your weight \_\_\_\_\_ kg

**J3-J10 Please evaluate your own health:**

	very good	good	so-so	bad	very bad
J3 How is your vision?	5	4	3	2	1
J4 How is your hearing ability?	5	4	3	2	1
J5 How is your appetite?	5	4	3	2	1
J6 How is your digestion?	5	4	3	2	1
J7 Do you feel energetic?	5	4	3	2	1
J8 How is your sleeping quality?	5	4	3	2	1
J9 Are you often in pain? (if so, choose "very bad")	5	4	3	2	1
J10 How is your overall health in comparison with age-mates?	5	4	3	2	1

**J11-J17 How was your mood in the past one month?**

	very good	good	so-so	bad	very bad
J11 Did you feel safe about your daily environment?	5	4	3	2	1
J12 Are you positive about the future?	5	4	3	2	1
J13 Do you feel happy?	5	4	3	2	1
J14 Do you feel self-confident?	5	4	3	2	1
J15 Do you feel relaxed and cheerful?	5	4	3	2	1
J16 How is your memory?	5	4	3	2	1
J17 Can you properly handle unpleasant matters (regarding life, studies and work)?	5	4	3	2	1

**J18-J23 Do you have the following negative moods?**

	never	seldom	so-so	often	always
J18 Do you feel empty and bored?	5	4	3	2	1
J19 Are you in a bad mood or depressed?	5	4	3	2	1
J20 Are you restless?	5	4	3	2	1
J21 Do you feel tense?	5	4	3	2	1
J22 Do you feel lonely, even among other people?	5	4	3	2	1
J23 Do you feel afraid without any reason?	5	4	3	2	1

**With sincere thanks for spending your precious time to fill in this questionnaire!**

In addition, we will get back to you or hold in-depth interviews with a number of interviewees. This will take about 20 minutes and you will receive another small gift in recompense. Please check and leave your contact information below.

K1 Would you be willing to participate in an in-depth interview? 1 yes 0 no

K2 Family name: Mr/ Ms \_\_\_\_\_

K3-K5 Contact: 1 home phone 2 cell phone 3 QQ 4 E-mail 5 other

## A.2.2 Questionnaire in Chinese



请问您当前是否居住在保障性住房社区内?

问卷编码:

## 广州市保障性住房居民需求调查

尊敬的住户:

您好!

广州保障性住房发展至今,数十万名居民入住在大大小小的保障性住房社区已有数年。为了解当前居民的居住体验,尤其是与您息息相关的生活工作便利度、社会融合度问题,中山大学地理科学与规划学院专题调研小组特展开此次调查问卷。

您是我们利用分层抽样方法从广州保障性住房社区十五万人口中抽选出的六百名被访者之一,您的回答对我们的研究非常重要,也会为政府制定相关政策并改善社区贡献力量。

问卷采用不记名方式进行,若可能请提供一个联系方式(电话、QQ或电子邮箱),以便回访之需,我们将依据**国家统计法**对资料进行严格保护!此外问卷答案没有对错之分,希望您**认真、真实地**回答每个问题,说明切实感受与看法,不必有任何顾虑。

问卷预计**20分钟**完成,为感谢您的积极参与,问卷结束后我们为感谢您提供信息将予以**酬劳20元**。

**真诚感谢您的支持与合作!祝阖家欢乐!**

中山大学地理科学与规划学院

2013年8月

(此表由访问员填写)

日期	2013年____月____日	调查组 编号	
问卷时间	开始:____时____分; 结束:____时____分	调查员 姓名	
问卷地点	____(区)____(社区名称)____(片 区)	督察员	

填表说明:

- (4) 本次调查问卷对象为**居住在保障房社区所有类型**的住户成员,要求年龄18岁(尽量为户主或其配偶),**每户**最多回答一份问卷。
- (5) 请在符合您想法的答案**前面对应的序号**上画“√”,请不要遗漏。如果有些题未列出适合您情况的项目,请在该题的空白处**注明**您的具体情况。
- (6) 若在填写问卷中出现问题,请寻求问卷发放者的帮助。

**第一部分 工作情况**

**A1 您现在是否拥有工作或个人事业（包括临时性工作）？**

1 是（请跳至 **A3** 开始回答）      0 否（请回答 **A2** 题）

**A2 若您现在没有工作或个人事业，原因是什么？**

1 退休    2 疾病    3 家庭限制（如有人需照料）    4 工作难找    5 不想工作    6 其他

请跳至 **A18** 题

**A3 您的工作性质是什么？**

1 长期正式合同工    2 短期正式合同工    3 非正式工作    4 自我雇佣    5 集体经营    6 其他

**A4 您通过何种方式找到当前的工作？**

1 小区公告    2 邻居介绍    3 朋友推荐    4 自己找（上网等）    5 政府帮助    6 用人单位来小区办招聘会    7 其他

**A5-A6 您目前的工作地点：** \_\_\_\_\_ 区 \_\_\_\_\_ 街道

**A7 目前您前往工作的通勤方式？**

1 步行    2 自行车    3 公共交通系统（包括公司班车）    4 电动车    5 小汽车    6 其他

**A8 目前您前往工作的单程通勤时间约为多少？**

①小于 15 分钟    ②15-30 分钟    ③30-60 分钟    ④1-1.5 小时    ⑤1.5-2 小时    ⑥大于 2 小时

**A9 目前您的每月通勤费用约为多少？**

①小于 50 元    ②50-100 元    ③100-150 元    ④150-200 元    ⑤大于 200 元

**A10 搬入保障性住房后，您是否改变过工作？**

1 是（请从 **A11** 开始回答）    0 否（请跳到 **A23** 题）

若上题（**A10**）选择“是”，请从下一题（**A11**）开始回答

**A11 您改变工作属于以下哪种类型？**

1 工作地点发生变化，工作内容没有变化    2 工作地点和工作内容都发生了改变  
3 工作地点没有变化，工作内容发生变化    4 工作地点和工作内容都完全没有变化

**A12-A14 若您前后工作地点有变化，原因是什么？（最多选三项）**

1 原来的工作距离家太远    2 原工作地点与住房之间交通不便利    3 新工作地点的收入水平高    4 新工作地点的工作机会更多  
5 新工作地点有更好的人际关系    6 从事非正规行业，地点变化频繁    7 其他

**A15-A17 若您前后的工作内容有变化，原因是什么？（最多选三项）**

1 新的工作类型收入高    2 新的职业圈内有更多朋友    3 掌握了新技能    4 对新的工作内容感兴趣    5 从事非正规行业，工作不稳定  
6 家庭限制（如有人需照料）    7 合同到期    8 被解雇    9 其他

**A18-A19 请问您上一份（原来的）工作的地点：**

\_\_\_\_\_ 区 \_\_\_\_\_ 街道（无工作者请在空白处填写“9999”，并跳至 **A31** 题开始回答）

**A20 原来您前往工作的通勤方式？**

1 步行    2 自行车    3 公共交通系统（包括公司班车）    4 电动车    5 小汽车    6 其他

**A21 原来您前往工作的单程通勤时间约为多少？**

①小于 15 分钟    ②15-30 分钟    ③30-60 分钟    ④1-1.5 小时    ⑤1.5-2 小时    ⑥大于 2 小时

**A22 原来您的每月通勤费用约为多少？**

①小于 50 元    ②50-100 元    ③100-150 元    ④150-200 元    ⑤大于 200 元

请跳到 **A31** 题继续回答

若 **A10** 题选择“否”，请从 **A23** 题开始回答。



## A23 您是否有意向改变工作地点？

1 是 0 否 (请跳至 A31 题)

## A24-A26 原因是什么？(最多选三项)

1 工作距离家太远 2 工作地点与住房之间交通不便利 3 目标工作地点的收入水平高 4 目标工作地点的工作机会更多 5 目标工作地点有更好的人际关系 6 从事非正规行业，地点变化频繁 7 其他

## A27 您是否有意向改变工作内容？

1 是 0 否 (请跳至 A31 题)

## A28-A30 原因是什么？(最多选三项)

1 目标工作类型收入高 2 目标职业圈内有更多朋友 3 掌握了新技能 4 对新的工作内容感兴趣 5 从事非正规行业，工作不稳定 6 家庭限制(如有人需照料) 7 合同将到期 8 其他

## A31 您觉得小区周边的工作机会的数量和质量怎样？

1 非常少 2 少 3 一般 4 多 5 非常多

## 第二部分 生活服务设施可达性

## B1-B9 您如何到达以下必要的基础设施(最常用的方式)？

	步行			自行车			电动车			公交或地铁			汽车		
	<20分钟	20-40分钟	>40分钟	<20分钟	20-40分钟	>40分钟	<20分钟	20-40分钟	>40分钟	<20分钟	20-40分钟	>40分钟	<20分钟	20-40分钟	>40分钟
B1 医疗机构	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B2 小学幼托	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B3 中学	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B4 肉菜市场	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B5 便利超市	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B6 大型购物中心	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B7 最近的公园	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B8 最近的公交站	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B9 最近的地铁站	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

## 第三部分 公平认知

C1-C19 从您的角度出发，您认为若要实现公平准则，以下列出的条件或要求是否合理？

您是否同意以下项目是保障性住房政策体系实现公平准则应该考虑的？

若要实现公平，以下要求是否合理？	非常合理	合理	一般	不合理	很不合理
C1 申请者必须拥有广州市本地户口	5	4	3	2	1
C2 申请者必须出示真实的家庭资产和收入水平	5	4	3	2	1
C3 申请者的家庭收入不能超过政府要求的上线	5	4	3	2	1
C4 申请者的申请信息需要被多次审查并公示	5	4	3	2	1
C5 申请者需要根据评分政策确定入住顺序	5	4	3	2	1
C6 申请者的住房位置是通过摇珠方法确定	5	4	3	2	1
C7 申请者的居住意向被纳入考虑并起到作用	5	4	3	2	1
C8 当申请者不符合居住条件时必须退出住房	5	4	3	2	1
C9 申请者可以平等的使用社区的公共设施	5	4	3	2	1
C10 申请者需要遵循社区管理条例(如扣分政策等)	5	4	3	2	1
C11 申请者的住房到工作地点之间的距离与城市大部分人无差异	5	4	3	2	1
C12 申请者的住房到城市大型公共资源的距离与城市大部分人无差异	5	4	3	2	1
C13 申请者居住的小区外有满足需求的公共交通系统	5	4	3	2	1
C14 申请者居住的小区周边有满足需求的教育设施	5	4	3	2	1
C15 申请者居住的小区周边有满足需求的医疗设施	5	4	3	2	1
C16 申请者居住的小区有满足需求的社区娱乐休闲空间	5	4	3	2	1

C17 申请者房子的房屋质量合格	5	4	3	2	1
C18 申请者的房屋使用面积满足家庭需求	5	4	3	2	1
C19 申请者的房屋设计格局合理舒适	5	4	3	2	1

#### 第四部分 邻里交往

##### D1-D10 您与以下人群的交往多不多？

	非常多	多	一般	很少	从不
D1 我与同一单元楼居民	5	4	3	2	1
D2 我与同一社区居民	5	4	3	2	1
D3 我与旁边社区居民	5	4	3	2	1
D4 我与搬迁前的老城区居民	5	4	3	2	1
D5 我与老广州人	5	4	3	2	1
D6 我与外来的新广州人	5	4	3	2	1
D7 我与社区廉租房居民	5	4	3	2	1
D8 我与社区经济适用房居民	5	4	3	2	1
D9 我与社区文化活动爱好者	5	4	3	2	1
D10 我与社会公益活动志愿者	5	4	3	2	1

##### D11 您在本社区的朋友数量？

①没有 ②1-4人 ③5-9人 ④10-20人 ⑤>20人

##### D12 搬入新社区后，您有新结识社区内的其他住户吗？

①没有 ②1-4人 ③5-9人 ④10-20人 ⑤>20人

##### D13 您和新认识的住户多久联系一次？

1一月不到1次 2一月2-3次 3一周一次 4一周2-3次 5每天

##### D14-D16 您是通过什么途径去认识这些住户的？（最多选三项）

1购物 2子女教育 3社区公共活动 4社区的网络讨论 5朋友介绍 6其他

##### D17 您觉得保障性住房小区的的邻里互相关照怎么样？

1很差 2不好，人情冷淡 3一般，能和睦相处，但接触不多 4比较团结，能集中处理一些共同问题  
5非常团结，互相帮助

##### D18-D20 您觉得保障性住房住户之间的矛盾和摩擦主要是什么？（最多选三项）

1工作休息时间不同，噪音影响 2生活卫生习惯不同 3饲养宠物 4私自占用公共资源和空间  
5车位 6观念不同 7素质差异 8其他

##### D21-D23 当邻里交往中产生矛盾时，您常用的解决方式是什么？（最多选三项）

1不了了之 2双方自行调节 3找小区其他人说理 4找物业公司协调 5去居委会调解  
6上访市级部门反映情况 7告知媒体 8其他

#### 第五部分 社会参与和社会信任

##### E1-E9 请问您与以下机构和组织的接触多不多？

	非常频繁	多	一般	很少接触	不接触
E1 广州市住房保障办公室	5	4	3	2	1
E2 广州市民政局	5	4	3	2	1
E3 小区的街道办事处	5	4	3	2	1
E4 小区居委会	5	4	3	2	1
E5 小区物业管理公司	5	4	3	2	1
E6 小区派出所	5	4	3	2	1
E7 小区社会志愿组织	5	4	3	2	1
E8 小区业委会	5	4	3	2	1
E9 新闻媒体	5	4	3	2	1

## E10-E17 您是否参加以下社区活动？

	每次都参加	经常参加	有时参加	很少参加	从不参加
E10 社区居民委员会选举	5	4	3	2	1
E11 社区业委会选举	5	4	3	2	1
E12 社区中心文化宣传活动（兴趣学习、技术学习等）	5	4	3	2	1
E13 社区中心文娱活动（唱歌、跳舞等）	5	4	3	2	1
E14 社区志愿者活动（帮助他人）	5	4	3	2	1
E15 社区自发捐款、捐物活动	5	4	3	2	1
E16 晨练、健身等户外休闲活动	5	4	3	2	1
E17 网络讨论或见面聊天有关社区建设问题	5	4	3	2	1

## E18-E22 在过去的一年里，您有以下经历吗？

	有	无
E18 被别人殴打	1	0
E19 被别人诈骗财物	1	0
E20 被别人偷窃	1	0
E21 被别人恐吓勒索	1	0
E22 被别人抢劫	1	0

## 第六部分 社区互动

## F1 您经常去周边商品房小区吗？

1 从不去 2 偶尔有事才去 3 隔几个星期去一次 4 隔几天去一次 5 非常频繁，几乎每天都去

## F2 您前往周边商品房小区的原因是什么？

1 与朋友聊天、休闲 2 工作需要 3 探望朋友或提供帮助 4 参与他们的社区活动 5 其他

## F3-F5 若您不愿意去周边的商品房小区，原因是什么？（最多选三项）

1 居民社会背景不同 2 没有时间 3 没有必要去 4 社区管理太严 5 社区环境卫生有差异 6 其他

## F6 周边的商品房小区的居民与贵小区有过社会活动的合作吗？

1 从来没有 2 很少有，每年有1-2次 3 有时有，大约每月1-2次 4 有，大约每周1-2次 5 非常频繁，几乎天天有

## F7 周边商品房居民是否主动与您交往？ 1 是 0 否

## F8 您是否主动与周边商品房居民交往？ 1 是 0 否

## F9 您是否信任周边商品房社区居民？

1 完全不信任 2 不太信任 3 一般 4 信任 5 非常信任

## F10 您与周边商品房居民交往是否存在困难？ 1 是 0 否

## F11-F13 您认为与周边商品房居民交往存在困难的原因是什么？（最多选三项）

1 观念不同 2 语言问题 3 生活习惯 4 地位差异 5 素质差异 6 没有接触的机会 7 其他

## F14 您是否有亲人或老朋友居住在周边商品房小区？ 1 是 0 否

## F15 自入住后，您是否因为有困难而寻求过其帮助？

1 从不 2 偶尔 3 经常

## F16 自入住之后，你们的交往增多还是减少了？

1 大幅度剧减 2 减少了 3 没有变化 4 增加了 5 极大增加

## F17-F19 请问你们交往频率变化的原因是什么？（最多选三项）

1 住房距离变化 2 社区身份差异 3 观念发生变化 4 小区管理差异 5 小区环境卫生 6 小区治安 7 其他

## 第七部分 社会认同

## G1 您认为自己的身份是

1 老广州人 2 新广州人 3 新社区人 4 外地人 5 其他

## G2 在您入住后，新认识了多少位周边商品房小区的居民？

①没有 ②10人以下 ③10多人 ④20多人 ⑤50人以上

## G3-G8 您愿意与周边商品房小区居民交往程度？

	非常愿意	愿意	没感觉	不愿意	完全不可能
G3 您愿意与周边商品房居民做知己	5	4	3	2	1
G4 您愿意与周边商品房居民做朋友	5	4	3	2	1
G5 您愿意与周边商品房居民做邻居	5	4	3	2	1
G6 您愿意与周边商品房居民做同事	5	4	3	2	1
G7 您愿意与周边商品房居民保持距离	5	4	3	2	1
G8 您愿意与周边商品房居民绝交	5	4	3	2	1

## G9 您觉得保障性住房社区与普通商品房小区有差别吗？

1 差别很大 2 有一定差别 3 差别很小 4 没有差别 5 没有感觉

## G10-G12 如果有差别的话，主要体现在哪些方面？（最多选三项）

1 地理位置 2 小区内配套设施 3 房屋质量 4 小区卫生环境 5 人员出入管理  
6 住户背景 7 政府投入 8 其他

## 第八部分 社会满意度

## H1-H19 您对社区以下方面满意吗？

	非常满意	满意	一般	不满意	很不满意
H1 住房室内通风	5	4	3	2	1
H2 住房室内采光	5	4	3	2	1
H3 楼道空间宽敞	5	4	3	2	1
H4 居住环境安静	5	4	3	2	1
H5 建筑质量	5	4	3	2	1
H6 住房面积	5	4	3	2	1
H7 户型设计	5	4	3	2	1
H8 街道照明	5	4	3	2	1
H9 社区内公共空间（绿化及康乐设施建设）	5	4	3	2	1
H10 物业管理	5	4	3	2	1
H11 社区公共服务	5	4	3	2	1
H12 治安状况	5	4	3	2	1
H13 学校幼托	5	4	3	2	1
H14 医疗卫生	5	4	3	2	1
H15 购物及相关商业设施	5	4	3	2	1
H16 社区内邻里关系	5	4	3	2	1
H17 与周边其他社区的融合度	5	4	3	2	1
H18 周边工作机会	5	4	3	2	1
H19 总体评价	5	4	3	2	1

H20-H40 请在标尺上标注您对周边公共服务设施的满意度评价（根据您的尺度，选择靠近您所感受的形容词的单元格）。

例：小区健身		非常丰富	5	4	3	2✓	1	非常匮乏
医疗设施	H20	非常近	5	4	3	2	1	非常远
	H21	技术非常全面	5	4	3	2	1	技术非常单一
	H22	非常信赖	5	4	3	2	1	完全不信赖
小学幼托	H23	非常近	5	4	3	2	1	非常远
	H24	师资非常充足	5	4	3	2	1	师资非常不足
	H25	质量很高	5	4	3	2	1	质量很差
中学	H26	非常近	5	4	3	2	1	非常远
	H27	师资非常充足	5	4	3	2	1	师资非常不足
	H28	质量很高	5	4	3	2	1	质量很差
肉菜市场	H29	非常近	5	4	3	2	1	非常远
	H30	供应非常丰富	5	4	3	2	1	供应非常匮乏
	H31	物价很低	5	4	3	2	1	物价很高
便利超市	H32	非常近	5	4	3	2	1	非常远
	H33	供应非常丰富	5	4	3	2	1	供应非常匮乏
	H34	物价很低	5	4	3	2	1	物价很高
购物中心	H35	非常近	5	4	3	2	1	非常远
	H36	物价很低	5	4	3	2	1	物价很高
公共交通站	H37	非常近	5	4	3	2	1	非常远
	H38	车辆非常丰富	5	4	3	2	1	车辆非常匮乏
	H39	进出非常顺畅	5	4	3	2	1	进出十分拥挤
总体评价	H40	非常满意	5	4	3	2	1	非常不满意

表示您认为小区健身器材“比较匮乏”

H41-H43 请选择三个您认为可能最理想的保障性住房小区：

H41\_\_\_\_\_小区； H42\_\_\_\_\_小区； H43\_\_\_\_\_小区

- 1 聚德花苑 2 棠德花苑 3 泽德花苑 4 积德花苑 5 金沙洲新社区 6 芳和花园 7 党恩雅轩  
8 广氮小区 9 龙归花苑 10 萝岗中心区项目 11 教师房改房（云龙居、育龙居等） 12 郭村小区  
13 万松园 14 泰安花园 15 新村项目 16 毛纺厂项目 17 安厦花园 18 亨元花园 19 苗和苑 20 惠泽雅轩

H44-H48 请问当您选择理想小区时优先考虑的五个因素？并按照优先顺序依次填写：

H44\_\_\_\_\_； H45\_\_\_\_\_； H46\_\_\_\_\_； H47\_\_\_\_\_； H48\_\_\_\_\_

- 1 地理位置是否靠近城区 2 是否上下班方便 3 交通是否便利 4 周边公共服务配套是否完备  
5 小区物业管理是否到位 6 教育资源是否充沛 7 医疗资源是否充足 8 商业环境是否优良 9 就业机会是否充足 10 住房质量是否过关 11 小区的日常消费单价（煤气、水电）是否合理 12 小区绿化是否充足  
13 小区内公共活动空间是否充足 14 小区廉租房和经济适用房的比例 15 小区不同类型保障性住房的空间布局 16 其他

H49 您是否愿意在这里长期居住？ 1 愿意 0 不愿意

H50 - H52 若您打算搬迁，原因是什么？（最多选三项）

- 1 地址偏远 2 保障性住房小区太多 3 交通环境不好 4 公共服务设施缺乏（教育、医疗等）  
5 就业机会少 6 其他

## 第九部分 住户信息（请将相应代码填写在每题下方空白单元格内）

	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11
	与户主关系	性别	年龄 (周岁)	婚姻状况	受教育程度	家庭结构	户口	若您拥有本地户口，您当前的户口于哪年获得	您的户口是否在保障房小区	您未迁移户口的原因	家庭类别
	10. 户主 11. 配偶 12. 子女 13. 父母 14. (外) 祖父母 15. (外) 孙子女 16. 兄弟姐妹 17. 非直系亲戚 18. 其他	3. 男 4. 女		4. 未婚 5. 已婚 6. 离异或丧偶	8. 未受过教育 9. 小学 10. 初中 11. 高中或中专 12. 大专或大学本科 13. 研究生及以上 14. 其他	6. 单人家庭 7. 核心家庭(两代人, 夫妻两人及未婚孩子) 8. 直系家庭(祖孙三代及以上) 9. 复合家庭 10. 其他家庭	5. 本市非农户口 6. 本市农业户口 7. 外地非农户口 8. 外地农业户口	(若自出生就是, 请填写“9999”)	2. 是 0. 否	(已迁移的请填写“9999”) 7. 方便子女上学 8. 方便就医 9. 享受更优的社会保障 10. 不在此小区常住 11. 此小区居委会工作欠佳 12. 其他	1. 低收入家庭 2. 低保户 3. 特困户 4. 孤寡老人、残疾人、烈士家属等特殊家庭 5. 普通家庭 6. 其他
受访人填写											

I12-I13	I14	I15	I16	I17	I18	I19	I20	I21-I23	I24-I29	I30	I31	I32
入住时间	住房类型	住房户型	居住楼层	住房面积 (m <sup>2</sup> )	共同居住人数	月租金 (元)	面临退出原因	住房迁移历史	社会保障	职业水平	家庭月总收入 (元)	家庭月总支出 (元)
(如: 2008.12)	10. 廉租房 11. 公租房 12. 经济适用房 13. 限价房 14. 拆迁安置房 15. 商品房 16. 未流转的解困安居房 17. 已流转的安居解困房 18. 其他	1. 一室一厅 2. 两室一厅 3. 两室两厅 4. 三室两厅 5. 其他				(若您不需要缴纳房租, 请填写“9999”) 公租房住户填写, 包括廉租房 (每平方米每月的租金, 如1元/每平方米每月)	(若您不面临退出问题, 请填写“9999”) 6. 子女毕业 7. 退休 8. 家庭收入超标 9. 违规 10. 其他	搬入保障性住房之前的住地点	(可多选) I24 养老保险 I25 医疗保险 I26 失业保险 I27 工伤保险 I28 住房公积金 I29 困难补助	(参考表下方的代码1) 在空白处填上相应序号)	10. <500 11. 500-999 12. 1000-1999 13. 2000-2999 14. 3000-3999 15. 4000-4999 16. 5000-5999 17. 6000-6999 18. >7000	1. <500 2. 500-999 3. 1000-1999 4. 2000-2999 5. 3000-3999 6. 4000-4999 7. 5000-5999 8. 6000-6999 9. >7000
								____市____区 ____街道				

代码 1: 1. 农业务工 2. 治安防管 3. 家政服务 4. 餐饮服务 5. 零售批发 6. 维修管理 7. 其他低端服务行业 (如美容、理发、司机等) 8. 工厂工人 9. 建筑业工人 10. 工匠 11. 商业工作人员 12. 企业管理人员 13. 专职技术人员 (教师、医生等) 14. 党政企事业单位负责人 15. 其他



## 第十部分 个人健康信息

J1 您的身高\_\_\_\_\_cm

J2 您的体重\_\_\_\_\_kg

J3-J10 请您对自己的身体健康状况进行评价。

	非常好	比较好	一般	比较差	非常差
J3 您的视力怎样	5	4	3	2	1
J4 您的听力怎样	5	4	3	2	1
J5 您的食欲怎样	5	4	3	2	1
J6 您的肠胃怎样	5	4	3	2	1
J7 您感到精力充沛吗	5	4	3	2	1
J8 您的睡眠质量怎样	5	4	3	2	1
J9 您的身体经常疼痛吗(经常疼痛请选“非常差”)	5	4	3	2	1
J10 与您的同龄人相比,总体来说,您认为你的健康状况如何	5	4	3	2	1

J11-J17 您最近一个月的心情怎样?

	非常好	比较好	一般	比较差	非常差
J11 您对日常生活环境感到安全吗	5	4	3	2	1
J12 您对未来乐观吗	5	4	3	2	1
J13 您有幸福的感觉吗	5	4	3	2	1
J14 您对自己有信心吗	5	4	3	2	1
J15 您感到轻松愉快吗	5	4	3	2	1
J16 您的记忆力怎样	5	4	3	2	1
J17 对于生活、学习和工作中发生的不愉快事情,您能够妥善处理吗	5	4	3	2	1

J18-J23 您会有以下负面的情绪吗?

	从来没有	很少	一般	经常	一直有
J18 您感到空虚无聊吗	5	4	3	2	1
J19 您感到心情不好、情绪低落	5	4	3	2	1
J20 您感到坐立不定、心神不宁	5	4	3	2	1
J21 您感到精神紧张吗	5	4	3	2	1
J22 与别人一起时,您也感到孤	5	4	3	2	1
J23 您会毫无理由地感到害怕吗	5	4	3	2	1

**对您花宝贵时间填满问卷, 我们表示诚挚的感谢!**

此外, 我们还将进行回访或抽取一定数量受访人员进行深入访谈, 大约用时 20 分钟左右, 另有一份小礼品作为酬谢。请勾选并留下您的联系方式。

K1 您是否愿意接受深入访谈? 1. 是 0. 否

K2 称呼: \_\_\_\_\_ 先生/女士

K3-K5 联系方式: 1 家庭电话 2 手机 3 QQ 号码 4 邮箱 5 其他



### A.3 In-depth interviews

Tab. A.3.1 The time of interviews, interviewees and numbers (Chapter 5.2.4 Fieldwork and Part III Operationalization: p. 117, 120)

Identity	Interview time	Interviewee	Details of interviewee	Amount
Policy designer	19th Jan 2013 18:00-19:00	Junfu Li	Leader of Guangzhou Bureau of Land Resource and Housing	5
	22nd Jan 2013 13:00-13:45	Minggui Xu	Director of Project Preparation Department, Guangzhou Bureau of Land Resource and Housing Service: Land reservation, site selection, project evaluation	
	22nd Jan 2013 14:00-14:30	Ying Yang	Director of General Department Service: Policy edition, archives administration	
	22nd Jan 2013 16:00-16:30	Ms. He	Director of Housing Management Department Service: Housing allocation, qualification examination	
	22nd Jan 2013 17:00-17:30	Yi Mei	Vice director of Housing Management Department Service: Housing allocation, qualification examination	
Administrator	19th Jan 2013 18:00-19:00	Ying Li	Secretary	6
	23rd Jan 2013 16:00-17:30	Mr. Ye	Vice director of Project Preparation Department Service: Location model	
	22nd Jan 2013 14:30-15:30	Ms. Liu	Vice director of Housing Management Department Service: Policy edition	
	20th Jan 2013	Jingyun Lin	Vice director of Service Center Service: Social housing community management	
	23rd Jan 2013 15:00-16:00	Ms. Lin Ms. Liang	Staff of Project Preparation Department Staff of Housing Management Department	
Community manager	11th Jan 2013 13:00-17:30	Dewu Wang Ms. Guorong Zhang	Leader of JUDE community property management company Leader of JUDE Neighborhood committee Staff of JUDE community property management company	3
	17th Jan 2013 14:00-15:00	Sui Zhenyi	Manager of JINSHAZHOU community work station, sub sector of Service Center, Guangzhou Bureau of Land Resource and Housing	1
	21st Jan 2013 14:00-15:00 21st Jan 2013 17:20-18:30	Xiongbin Zhou Mr. Chen	Director of FANGHE community property management company Staff of FANGHE community property management company	2
	24th Jan 2013 10:00-11:30 24th Jan 2013 16:10-16:30 24th Jan 2013 14:30-16:00	Zhongyi Tong Weicheng Yao Ms. Chen	Director of TANGDE community property management company Vice director of TANGDE community property management company Staff of TANGDE community property management company	3
	25th Jan 2013 09:00-12:00	Xian Liu	Director of ZEDE community property management company	1
Resident	15th Jan 2013 10:00-11:00 15th Jan 2013 11:15-11:45 15th Jan 2013 12:00-12:20 15th Jan 2013 12:30-13:05 15th Jan 2013 13:15-13:50 15th Jan 2013 14:00-14:30 15th Jan 2013 15:10-15:45	Ms. Yue Ms. Xu Ms. Zheng Ms. Chen Mr. Liang Mr. Zhang Mr. Wu	Resident of affordable housing, JUDE, moving-in in March 2012 Resident of affordable housing, JUDE, moving-in in 2012 Resident of affordable housing, JUDE, moving-in in June 2012 Resident of affordable housing, JUDE, moving-in in 2008 Resident of Low-rent housing, JUDE, moving-in in 2008 Resident of Low-rent housing, JUDE, moving-in in 2004 Resident of Low-rent housing, JUDE, moving-in in 2007	7
	13th Jan 2013 14:00-15:00 17th Jan 2013 15:00-17:30	Wensong Wu	Resident of affordable housing, JINSHAZHOU, moving-in in 2008 JINSHAZHOU	4
	21st Jan 2013 15:10-15:30 23rd Jan 2013 15:35-16:00 23rd Jan 2013 16:00-16:25 23rd Jan 2013 16:30-17:00	Ms. Li Mr. Liang Mr. He Mr. Luo	Resident of Low-rent housing, FANGHE, moving-in in May 2012 Resident of affordable housing, FANGHE Resident of affordable housing, FANGHE, moving-in in Nov. 2011 Resident of affordable housing, FANGHE, moving in in Nov. 2011	4
	24th Jan 2013 14:30-15:00 24th Jan 2013 15:00-15:30 24th Jan 2013 15:30-16:00 24th Jan 2013 16:40-17:00	Chonghao Zhu Guoqiang Tan Ms. Zhou Ms. Tang	Resident of Low-rent housing, TANGDE, moving-in in 2003 Resident of Low-rent housing, TANGDE, moving-in in 1999 Resident of affordable housing, TANGDE, moving-in in 1999 Resident of early social housing built in 1990s, moving-in in	4

			1999	
	25th Jan 2013 13:30-16:00		ZEDE	3
Expert	07th Jan 2013 09:30-10:40	Xue Desheng	Professor of Sun-Yat sen University Concrete fieldtrip method, research guidance Social housing construction in Guangzhou, research cooperation Urban poverty in Guangzhou	3
	07th Jan 2013 11:00 -12:00	Li Zhigang	Professor of Sun-Yat sen University Concrete fieldtrip method, research guidance Social housing construction in Guangzhou, research cooperation Urban poverty in Guangzhou	
	16th Jan 2013 15:00-16:00	Yuan Yuan	Professor of Sun-Yat sen University Concrete fieldtrip method, research guidance Social housing construction in Guangzhou, research cooperation Urban poverty in Guangzhou	
<b>Total</b>				<b>48</b>

Source: based on personal communication with interviewers, Jan 2013.

### 1) Interview questions for managers in government

Aim: To know the standpoint and considered factors of government in social housing construction. Understand the justice and spatial justice perceptions from their parts.

#### Part A: Plan of social housing construction

- The total providing number and the calculate methods of social housing, why?
- The constitution and providing percentage of every type of social housing, why?
- How many new constructed housing and how many second-hand housing and the percentages in each type of social housing? Why?

#### Part B: Allocation procedure

- Do you think current allocation procedure meet the standard of justice? Why?
- In which method, the government try to meet the allocation justice currently?

#### Part C: Location procedure

- The main land resource of social housing. Land collection plans of social housing construction.
- The location procedure of social housing.
- What factor will be considered in the stage of land supply plan and land approval? Are the factors of justice and location place considered by government during location procedure? Why?
- The location of social housing is located more and more far away from city center and social housing communities becomes bigger and bigger, what is your idea on this situation?
- Is this the tendency of social housing construction in future? Do you think this is justice?
- Which kind of social housing communities have been constructed and are going to be designed? Mixed or single communities? Why?
- The differences (especially the location policy) between different types of social housing community construction.

#### Part D: Justice and spatial justice

- What are criteria of justice in allocation procedure?
- What are the justice and spatial justice in your ideas? What is the assess criteria system from your parts?
- The degree and problems of justice and spatial justice situation in current social housing communities.

#### Part E: Measures

- How you understand the possible influences of injustice and spatial justice? What are the possible affections of injustice?
- Have you done anything for meeting the spatial justice? If has, show it.
- Do you think spatial justice has been took into considered currently? If yes, what the tendency? If no, why?
- What will you do to meet justice and spatial justice?

Part F: Others

- Could you talk some social housing projects in Guangzhou?
- Which project is the most justice or most injustice from your perception? Which project has highest spatial justice or heist injustice? Why?

## 2) Interview questions for managers in community

Aim: To know relations and roles of actors and channels in justice system. To know how are they understand the justice and spatial justice. To know implement results of relative policy from their assessment.

Part A: The justice and spatial justice

- What are justice and spatial justice from your part? Which element is the more important?
- Do you think your perception of justice is similar to government and residents?
- Assess the justice degree and spatial justice degree.

Part B: Roles of government

- Based on your work perspective, please describe the actors and roles of social housing system.
- What is your sector's function in social housing system? What is your idea on finding method to improve justice degree, and who can be the powerful actors?

Part C: Community management

- How many people live here?
- The interpersonal relationship.
- What is the most unsatisfied part of the residents?

## 3) Interview questions for experts

### Prof. Yuan Yuan, Sun Yat sen University

目的: 了解广州过去 20 年城市贫困景观变化及城市贫困的地理分布与保障性住房之间的关系。

Part A: 概念

- 广州的贫困标准是什么?
- 城市贫困群体的划分标准与低收入人群划分标准的关系与差异。

Part B: 城市贫困群体

- 广州贫困人群的人口特征 (年龄结构, 身份), 谁是主体人群?
- 城市贫困人群在过去 20 年的数量变化, 有没有巨大的变动或转型点? 为什么?

Part C: 城市贫困的空间分布

- 广州过去 20 年城市贫困人群的居住环境, 活动范围及住房形式的变化。
- 过去 20 年广州贫困人群的空间迁移特点。
- 随着时间变化, 广州贫困人群的聚集程度变化, 集聚度增强还是降低? 为什么?
- 从您当前的研究出发, 目前城市贫困人群主要分布集中在哪里?
- 城市贫困人群的存在形式和种类? 不同类型贫困人群的比例。

- 随着保障性住房的建设，保障性住房政策如何影响城市贫困的空间形态？
- 有多少贫困人群居住在保障性住房社区？

#### Part D: 行动者

- 导致城市贫困人群迁移和集聚的作用力和行动者是谁？
- 当地政府在城市贫困景观的形成中起到什么作用？
- 意义重大的几次贫困人群迁移的原因和作用者。
- 保障性住房政策的公布与实施是否对贫困人群产生影响？影响在哪里？如何影响？

#### Part E: 问题

- 当前城市贫困人群的主要面临的问题是什么？
- 政府或相关有一定作用力的组织机构在城市贫困的现状问题（尤其是地理角度）上有何动向和举措？
- 您如何看待保障性住房建设影响空间公平这个作用关系的？
- 从您的角度看，我们应该如何提高空间公平程度？渠道和作用者？
- 您是否能够对本研究给予一些建议和意见？

#### Prof. Li Zhigang, Sun Yat-sen University, Wuhan University

目的：了解当前有关保障性住房的研究重点；您认为广州保障性住房与新移民之间联系。

#### Part A: 研究讨论

- 您当前的研究重点为什么从新移民转向保障性住房研究？您当前的研究方向是什么？原因。
- 您认为保障性住房的研究的意义与前景在哪里？
- 我国保障性住房的研究缺乏什么？
- 您认为我国保障性住房体系建设过程中出现的最大问题在哪里？可能出现的障碍与矛盾是什么？
- 广州保障性住房的特点？
- 广州保障性住房体系建设主要参考新加坡的模式，那您认为西方其他城市的保障性住房在哪些方面会能做到补充与完善？

#### Part B: 我的研究

- 我当前的研究是居于空间公平理论基础上的，着重在于城市的资源布局、保障性住房社区差异与社区内部空间管理的差异，最终落点于政策影响空间的行动者网络体系，您认为如何？有什么意见与建议？
- 我采用的主要理论基础为空间公平与社会公平，但是在两者的衔接上还没有想法，您认为这两者的联系与差异在哪里？
- 论文采用的方法主要为 GIS 空间分析资源布局（利用统计数据 and 定点数据）、计量分析（统计数据的相关性），定性描述，概念地图，您对此有什么好的建议么？
- 您认为保障性住房对新移民的影响的利弊。
- 在您的意识中，政策体系建设与居民层面管理体系之间关系是否紧密？哪个更具影响力和意义？

#### Part C: 扩展

- 据您的了解，瑞士的地理研究也同样值得了解和借鉴？
- 您在数据资料的获取方面有什么经验或渠道吗？

#### 4) Interview questions for residents

目的：了解居民眼中的公平与空间公平与政府和社区管理人员眼中的公平的差异。通过了解居民空间行为特点分析空间公平。了解政策出发点与实施结果的差异和原因。

##### Part A: 租金、就业等生活行为

- 您的入住时间与住房类型？
- 您当前住房租金？
- 您的工作基本情况（属性，地点，时间，通勤）？
- 您的收入范围与家庭结构如何？
- 您的商娱地点主要是哪里？您前往市中心的频率？前往原因？
- 您认为周边基础设施（交通、教育、医疗等）如何，社区环境如何？

##### Part B: 公平与空间公平

- 根据图一的框架，描述并绘制您所认为的公平和空间公平，主要评价因素是什么？
- 您认为当前社区最大的优势和劣势分别在哪里（对您的影响最大的方面）？
- 请您分别与商品房和其他所了解的保障性住房小区（芳和、同德围、棠德、聚德、龙归、郭村）相比，当前保障性住房小区的特点、问题、不足。
- 去除考虑收入问题，你是否愿意搬往另一个保障性住房社区？主要吸引力是什么？
- 相比于曾经的住房，你对现在的住房满意吗？是否生活环境有一定程度改善？
- 您认为在不同的保障性住房小区的建设管理中是否存在不公平？原因？
- 您觉得当前小区管理中，经适房与廉租房之间存在交流障碍和差异化管理吗？
- 您认为在住房再分配过程中是否达到公平？

##### Part C: 行动者作用

- 您在生活当中所遇到的问题主要是哪方面的？与社区那些机构或组织联系紧密？
- 当你们对某些政策不满意时，通过什么渠道反应？
- 从您的角度，如何评价政府和社区管理者的角色和作用渠道？请在图二中进行描绘。
- 您认为在整个管理体系中，哪方面存在断层与不足，您希望怎样提高？

##### Part D: 问题

- 您当前的最大问题是什么？
- 作为一名保障性住房小区的居民来说，您认为社区内还没有其他比较特别的现象？
- 是否方便留下您的姓名与联系方式？

## A.4 Glossary DMAX / BIOS of fixed nouns and phrases

Tab. A.4.1 Chinese and English words comparable form

No.	中文	English	Explanation
1	保障性住房	Social housing	Social housing is a generic term of housing with social security property. Social housing in China refers to policy-related housing with quality of social guarantee, which is constructed base on government's welfare policy support and has restrictive construction standard, targeted group, sales or rent price. In Guangzhou, social housing includes public-rental housing (low-rent housing), affordable housing, price-capped housing and early social housing (ANJU housing & JIEKUN housing) built in 1990s.
2	福利住房/ 公房	Welfare housing (also named public housing in China) / In-kind housing	Welfare housing is, from 1949 to 1998, national government funded and local government and state-owned enterprises & institutions ( <i>Dan Wei</i> ) constructed and managed public housing (Wu, 2012). People were accessible to live in public housings of state-owned enterprises & institutions or local government with very little rent. The ownerships of all housings belonged to government and state-owned enterprises, individuals had no right of disposal.
3	90年代末早期保障性住房 (安居住房, 解困住房)	Early social housing in 1990s, includes ANJU housing, JIEKUN housing	Refers to earliest social housing type built in first turn in 1990s. Two housing projects (ANJU & JIEKUN) were constructed with government financial support and allocated to low-income families with local residence permit (HUKOU). The ownership had transferred to private in 10years. In Guangzhou, YUNYUAN, DATANG & TONGDE are three residence neighborhoods in this period.
4	拆迁安置住房	The resettlement housing	
5	房改房	Reformed housing	Reformed housing implies dwellings that hold by work units and sold the ownerships to household in subsidized price (Deng, Hoekstra & Elsinga, 2004). This progress also named housing privatization lowly started from economy reform in 1978 and speeded up from 1998.
6	商品房	Market housing/ commercial housing/ commodity housing	
7	廉租住房	Low-rent housing	Low-rent housing firstly proposed in 1998 in housing reform document, refers to state or state-owned company implements their social guarantee abilities, to provide normal housing in low rent to local lowest-income inhabitants. The standard of lowest-income family is formulated by city government or town government. (State Council, 2007a) Low-rent housing can be collected from vacant old state-owned housing, or establish new housing by government or state-owned company. The rent of low-rent housing uses government pricing mode. (State Council, 1998) The low-rent housing in Guangzhou is only target to low-income residents with local register (HUKOU). The standard level of low-income family refers to per capital annual disposable income less than 7680 RMB in 2010 (equal to 1178.77 US Dollar, calculate with average exchange rate of 2010). This amount has been improved twice to 15600 RMB (2393.56 US Dollar, calculate with average exchange rate of 2012) in 2012 and to 22600 RMB (3467.95 US Dollar, calculate with average exchange rate of 2015) in 2015. (Guangzhou Local Government, 2010, 2012, 2015)
8	公共租赁住房	Public-rental housing	Public-rental housing was put forward in 2010, is refers to housing is funded and constructed by government with supportive polices, is one type of social housing and aims to provide rental housing to middle- and low- income families in low and affordable rent. (Ministry of Construction, 2010) Public-rental housing is provided for middle- and low- income family housing problems. In some areas with more competent, The difference of public-rental housing to low-rent housing is the broader guarantee range, which suggested to include new employees and stable migrant worker who lives in city for certain year. Provision of public-rental housing aims to solve migrants' difficulties in accessing local housing, which caused by HUKOU scheme. In Guangzhou, the main targeted group is low- income family and new employee group, middle- income families is partly included. In 2012, low-rent housing was merged into public-rental housing; HUKOU (local register) is no longer admittance in public-rental housing system (Guangzhou Local Government, 2010).

9	经济适用住房	Economically affordable housing	Affordable housing refers to policy-related housing with a quality of social guarantee, has limited dwell area and price, constructed with government favourable policy and according to rational criteria, sales to city low-income family with housing problem. (State Council, 2007b) Affordable housing refers to policy-related housing with a quality of social guarantee, has limited dwell area and price, sales partly property right to local middle- and low- income families in low price.(Guangzhou Local Government, 2007)
10	限价房	Price-capped housing, also named double price-capped housing	Price-capped housing refers to the housing constructed and sale under rigid requirements on land price and housing price defined by government, therefore, also named double price capped housing. (Guangzhou Local Government, 2008) Price-capped housing is policy support commercial housing, whose ownership can be traded in the market. Price-capped housing aims to remit housing problems of middle-income family and restrain overgrowth of market housing price.
11	低收入家庭	Low-income family	See row 7
13	最低收入家庭	Lowest-income family	
14	特殊困难家庭	Special difficult family	
15	低保户	Household enjoying the minimum living guarantee	
16	低保	Minimum living standard support	
17	中等偏下困难家庭	Lower middle income family	
18	中低收入家庭	Middle- and low-income family	
19	中等收入家庭	Middle-income family	
20	新就业无房人员	New employee without house	
21	外来务工人员	Migrant worker	
22	实物补贴	Subsidy in kind	
23	户口	HUKOU / Resident register system/ Local registration / household registration	The household registration was established in 1958 which aims to confine population mobility between urban and rural. Initiation of this system aimed to limit rural-urban migrations and ensure progress of inadequate resource allocation. This system divides population into rural/agricultural and urban/non-agricultural categories. Rural-to-urban immigration was strictly restrained by state with non-guarantee policy on job, housing and even food terms before 1978 (Chan, 1992; 2009; Cheng & Selden, 1994). The rural-to urban migration was deregulated from 1978, however, Hukou still intensely connects to society security, land, housing and job, constrains immigrants' accessibility to social rights.
24	单位 Dan Wei	Dan Wei/ (State) work Units/ State-owned Enterprises & Institutions	The term is a general name of working organization in China. The term is used to express entities, in which an individual is working for (Deng, Hoekstra & Elsinga, 2004). Although Danwei is still used recently in describing all kinds of employment entities (Womack, 1991), we commonly consider the term, widely used in planning economy era and later reform era, includes institutions of state, like central government, local government, and state-owned enterprises (wu, 2012).
25	住房公积金	Housing provident fund / Public accumulation fund	The fund refers to the local policy that selectively learned from Singapore since 1990s (Hamer & Steekelenburg, 2002). The fund was firstly implemented in several Chinese big cities like Shanghai as a subsidized financial support (Wu, 2012). Both work units and workers contribute to the fund to improve commercial housing affordability. Amount of fund is decided by income level and deduction percentage of housing provident fund.
26	房屋抵押贷款	Bank mortgage	The mortgage refers to the fund from bank to available housing demanders in commercial housing purchase (Hamer & Steekelenburg, 2002).
27	住房公有化	Confiscation / convergence of private housing into public ownership	Time: Policy References:

28	住房商品化	Housing commercialization /	Time: References
29	住房私有化 / 公房出售	Public housing privatization	
30	双轨制	Dual-track housing system/ Dual-track approach	1978-1998 Housing market Public housing served by state Construction-allocation separation: market deal with commercial housing construction and state control commercial housing allocation References
31	国务院	State Council	
32	建设部	Ministry of Construction	
33	发改委	National Development and Reform Commission	
34	财政部	Ministry of Finance	
35	民政部	Ministry of Civil Affairs	
36	国务院办公厅	Office of State Council	
37	中央政府	The national government / The central government	The central government can be understood as the head of the outsourcing system, which includes different levels of territorial administrative units.
38	地方政府	The local government of Guangzhou City / Local state	The local state is the subordinate authority of polity system. The local state is supervised and regulated by the central government. The local government can achieve finance to establish necessary infrastructure and to construct space.
39	广州市政府	Guangzhou local government / City government / city authority / city administration / Guangzhou administration	
40	中国国家统计局	CNSB (China National Statistical Bureau)	
41	广州规划局	Guangzhou Planning Bureau	
42	广州市统计局	Bureau of Statistics of Guangzhou	
43	民政局	Bureau of Civil affairs of Guangzhou	
44	广州市国土资源与房屋管理局	Guangzhou bureau of land resource and housing	
45	市住房保障办公室	Social Housing Office of Guangzhou city	
46	**区住房保障办公室	Housing office of ** district	
47	社区工作站	Residential neighborhood work station	The sub-organization of Social Housing Office of Guangzhou Local Government, the one set in social housing community for management and policy implementation.
48	街道办事处	Sub-district Office / street committee / neighborhood committee	
49	居民委员会	Neighborhoods committee	The smallest management unit lead by the Local Civil Affairs Bureau
50	业主委员会	Owners Committee	A self-organized group raised by residents with private housing ownership, which aims to protect self-right and feedback to management and authority.
51	物业管理公司	The property management company	
52	社区/居住小区	Residential neighborhood	Refers to an independent residential unit, in which has private infrastructures like life market, sport area, nursery school, and even primary school.
53	组团	Residential cluster	Each community is divided into several spatial sectors by inside roads, fences, green belts or building. The housing in different sectors may differentiate in targeted group, housing type, dwelling area.



## A.5 Abbreviation list

Tab. A.5.1 Abbreviation list of this study

Abbreviation	Full name	
	English	Chinese
2SFCA	Two-Step Floating Catchment Analysis	两步推移法
2SLS	Two-Stage Least Squares	两段最小平方法
CBD	Central Business Center	中心商业区
CFA	Confirmatory Factor Analysis	验证性因素分析
CPRN	Canadian Policy Research Network	加拿大政策研究网
CPT	Central Place Theory	中心地理论
E2SFCA	Enhanced Two-Step Floating Catchment Analysis	增强型两步推移法
EAH	Economically Affordable Housing	经济适用房
ECI	External Community Integration	外部社区一体化
EFJ	Equity, Fairness, Justice	平等、公平、公正
FYP	Five Year Plan	五年规划
GBLH	Guangzhou Bureau of Land Resource and Housing	广州国土局
GCAB	Guangzhou Civil Affair Bureau	广州民政局
GPB	Guangzhou Planning Bureau	广州规划局
HPT	Housing Provident Fund	住房公积金
IDW	Inverse Decay Weight	逆衰减权重
IZ	Inclusionary Zoning	包容性区划
LBS	Location Based Services	基于位置的服务
LEA	Least Accessible Services	低度可达设施
LES	Less Accessible Services	中度可达设施
LRH	Low-Rent Housing	廉价房
MAUP	Modifiable Areal Unit Problem	可塑性面积单元问题
MOS	Most Accessible Services	高度可达设施
MTO	A Program of "Moving to Opportunity"	计划“搬向机遇”
OECD	The Organization For Economic Co-Operation and Development	经济合作与发展组织
OLS	Ordinary Least squares	普通最小二乘法
PCH	Price-Capped Housing	限价房
PRD	Pearl-River Delta	珠江三角洲
PRH	Public Rental Housing	公共租赁房
SMH	Spatial Mismatch Hypothesis	空间不匹配假设
SRV	Social Role Valorisation	维持社会角色价值

## A.6 The categories of occupation

**Tab. A.6.1 Categories of vocation, occupation and occupational level** (Chapter 8.3.2 Occupational level of social housing residents, and Chapter 9.1.2 Employment change experienced by respondents regarding occupation: p.205, 209)

I30 <sup>a</sup>	I30_Re <sup>b</sup>	Occupation hierarchy
Vocations	Occupations	
1. Farm worker	1. Persons in agriculture, farming, fishing & forestry industries	Lower-skilled jobs
2. Security management		
3. Housekeeping		
4. Catering services		
5. Wholesale and retail		
6. Maintenance management		
7. Other service trades (e.g. hairdresser, cosmetics, restaurant waiter, driver etc.)		
8. Factory worker	2. Commercial personals, resident services and other services providers	Lower-skilled jobs
9. Construction worker		
10. Craftsman		
11. Business personnel	3. Technicians in production, transportation, operatives etc.	Higher-skilled jobs
12. Business management personnel		
13. Full-time professional (teacher, doctor, etc.)		
14. Responsible for government and civil servant		
15. Other	4. Professional technicians	Higher-skilled jobs
	5. Clerks, managers of state agencies, party organizations & enterprises	
	6. Other	

Note: <sup>a</sup> I30 is original survey question which encloses 15 categories of jobs, and responders were required to answer with their jobs (vocations).

<sup>b</sup> I30\_Re is derived variable of I30, with regroup process that according to occupation classification of the sixth census of Guangdong province, 15 vocations of I30 have been integrated into 6 groups. See categories of vocation and occupation of the sixth census in following table.

Source: Own draft based on normal classification on occupations. Sep, 2017.

Tab. A.6.2 Categories of vocations and occupations in the sixth census, Guangdong

Categories of industries		Categories of occupations	
code	primary title	code	primary title
1	Agriculture, farming, fishing & forestry industry	1	Managers of state agencies, party organizations & enterprises
2	Mining industry	2	Professional technicians
3	Manufactory	3	Clerks and relative staffs
4	Electric, fuel & water industry	4	Commercial personals and service providers
5	Construction industry	5	Persons in agriculture, farming, fishing & forestry industrie
6	Transportation, warehousing and postal industry	6	Technicians in production, transportation, operatives etc.
7	Information transmission computer services and software industry	7	Other
8	Wholesale and retail industry		
9	Hotel and catering industry		
10	Financial industry		
11	Real estate industry		
12	Leasing and business industry		
13	Scientific research and technical services and geological prospecting industry		
14	Water conservancy environment and public facilities management		
15	Resident service and other services		
16	Educational industry		
17	Health, social security and social welfare service		
18	Cultural, sport and entertainment service		
19	Public management and social organizations		
20	International organizations		

Source: Own draft, data source: the sixth census of Guangzhou, 2010, URL: <http://www.gzstats.gov.cn/pchb/rkpc6/l4-2-18-2.htm>; <http://www.gzstats.gov.cn/pchb/rkpc6/l4-2-12.htm> [access on 20, Sep, 2017].

## A.7 The year of development periods

**Tab. A.7.1 Development periods of China since 1949** (Chapter 3.1.2.1 Formation of welfare housing system, p.43)

Period	Short phases	Year
Recovery period		1949 - 1952
First five-year plan period	1st FYP	1953 - 1957
Second five-year plan period	2nd FYP	1958 - 1962
- Great leap forward		- 1956 - 1960
Adjustment period	--	1963 - 1965
Third five-year plan period	3rd FYP	1966 - 1970
Fourth five-year plan period	4th FYP	1971 - 1975
Fifth five-year plan period	5th FYP	1976 - 1980
Sixth five-year plan period	6th FYP	1981 - 1985
Seventh five-year plan period	7th FYP	1986 - 1990
Eighth five-year plan period	8th FYP	1991 - 1995
Ninth five-year plan period	9th FYP	1996 - 2000
Tenth five-year plan period	10th FYP	2001 - 2005
Eleventh five-year plan period	11th FYP	2006 - 2010
Twelfth five-year plan period	12th FYP	2011 - 2015

## A.8 Correlations and result of the one-way ANOVA on commuting data

**Tab. A.8.1 Results of Pearson correlation between variables commuting time, commuting mode and commuting cost** (Chapter 9.2.2 Changes in commuting behaviour, p.213)

	Correlation value	Sig. (2-tailed)	n
<b>Previous</b>			
A20 & A21: mode & time	0.434**	0.000	417
A21 & A22: time & cost	0.448**	0.000	417
A20 & A22: mode & cost	0.523**	0.000	417
<b>Currently</b>			
A7 & A8: mode & time	0.362**	0.000	182
A8 & A9: time & cost	0.510**	0.000	182
A7 & A9: mode & cost	0.454**	0.000	182

Note: \*\*: Correlation is significant at the 0.01 level (2-tailed). A7, A8 and A9; A20, A21 and A22 are the code of variables, A7 & A20 refer to commuting mode, A8 & A21 represent commuting time, and A9 & A22 refer to commuting cost per month. Only residents who employed currently are included. Source: 660 questionnaires in 13 communities, Guangzhou, surveyed in 9. 2013 and 9.2014, Chao. R.

**Tab. A.8.2 Test of homogeneity of variance** (Chapter 9.2.2 Changes in commuting behaviour, p.213)

		Levene statistic	df1	df2	Sig.
<b>Previous</b>					
A20: commuting mode	by time	11.296	5	411	0.000
	by cost	18.764	4	412	0.000
A21: commuting time	by mode	2.033	5	411	0.073
	by cost	0.875	4	412	0.479
A22: commuting cost	by mode	23.803	5	411	0.000
	by time	16.998	5	411	0.000
<b>Currently</b>					
A7: commuting mode	by time	10.215	5	176	0.000
	by cost	7.264	4	177	0.000
A8: commuting time	by mode	5.533	5	176	0.000
	by cost	6.153	4	177	0.000
A9: commuting cost	by mode	4.358	5	176	0.001
	by time	7.639	5	176	0.000

Source: 660 questionnaires in 13 communities, Guangzhou, surveyed in 9. 2013 and 9.2014, Chao. R.

**Tab. A.8.3 Multiple comparisons on variable “A21 commuting time” by variable “A20 commuting mode” and by variable “A22 commuting cost”** (Chapter 9.2.2 Changes in commuting behaviour, p.213)

	(I) A20	(J) A20	Mean difference (I-J)	Std. Error	Sig.	95 Confidence interval		
						Lower bound	Upper bound	
A21 commuting time	by foot	by bicycle	-0.722*	0.142	0.000	-1.00	-0.44	
		by public transport	-1.565*	0.119	0.000	-1.80	-1.33	
		by electric bicycle	-1.200*	0.403	0.003	-1.99	-0.41	
		by car	-1.533*	0.683	0.025	-2.88	-0.19	
		others	-0.390	0.375	0.298	-1.13	0.35	
	by bicycle	by foot	0.722*	0.142	0.000	0.44	1.00	
		by public transport	-0.843*	0.119	0.000	-1.08	-0.61	
		by electric bicycle	-0.478	0.403	0.236	-1.27	0.31	
		by car	-0.811	0.683	0.236	-2.15	0.53	
	by public transport	others	0.332	0.375	0.377	-0.41	1.07	
		by foot	1.565*	0.119	0.000	1.33	1.80	
		by bicycle	0.843*	0.119	0.000	0.61	1.08	
		by electric bicycle	0.365	0.395	0.357	-0.41	1.14	
		by car	0.032	0.679	0.963	-1.30	1.37	
	by electric bicycle	others	1.174*	0.367	0.001	0.45	1.90	
		by foot	1.200*	0.403	0.003	1.21	1.99	
		by bicycle	0.478	0.403	0.236	-0.31	1.27	
		by public transport	-0.365	0.395	0.357	-1.14	0.41	
		by car	-0.333	0.780	0.669	-1.87	1.20	
	by car	others	0.810	0.532	0.129	-0.24	1.85	
by foot		1.533*	0.683	0.025	0.19	2.88		
by bicycle		0.811	0.683	0.236	-0.53	2.15		
by public transport		-0.32	0.679	0.963	-1.37	1.30		
by electric bicycle		0.333	0.780	0.669	-1.20	1.87		
others	others	1.143	0.766	0.136	-0.36	2.65		
	by foot	0.390	0.375	0.298	-0.35	1.13		
	by bicycle	-0.332	0.375	0.377	-1.07	0.41		
	by public transport	-1.174*	0.367	0.001	-1.90	-0.45		
	by electric bicycle	-0.810	0.532	0.129	-1.85	0.24		
		by car	-1.143	0.766	0.136	-2.65	0.36	
	(I) A20	(J) A20	Mean difference (I-J)	Std. Error	Sig.	95 Confidence interval		
						Lower bound	Upper bound	
A21 commuting time	<50yuan	50-100yuan	-0.711*	0.143	0.000	-0.99	-0.43	
		100-150yuan	-1.003*	0.127	.000	-1.25	-0.75	
		150-200yuan	-1.447*	0.189	.000	-1.82	-1.08	
		>200yuan	-1.285*	0.239	.000	-1.75	-0.82	
	50-100yuan	<50yuan	0.711*	0.143	.000	0.43	0.99	
		100-150yuan	-0.292	0.162	0.073	-0.61	0.03	
		150-200yuan	-0.735*	0.214	0.001	-1.16	-0.32	
	100-150yuan	>200yuan	-0.574*	0.259	0.027	-1.08	-0.06	
		<50yuan	1.003*	0.127	0.000	0.75	1.25	
		50-100yuan	0.292	0.162	0.073	-0.03	0.61	
	150-200yuan	150-200yuan	-0.444*	0.204	0.030	-0.84	-0.04	
		>200yuan	-0.282	0.251	0.261	-0.77	0.21	
		<50yuan	1.447*	0.189	0.000	1.08	1.82	
		50-100yuan	0.735*	0.214	0.001	0.32	1.16	
	>200yuan	100-150yuan	0.444*	0.204	0.030	0.04	0.84	
		>200yuan	0.162	0.287	0.573	-0.40	0.73	
		<50yuan	1.285*	0.239	0.000	0.82	1.75	
		50-100yuan	0.574*	0.259	0.027	0.06	1.08	
			100-150yuan	0.282	0.251	0.261	-0.21	0.77
			150-200yuan	-0.162	0.287	0.573	-0.73	0.40

Social housing scheme in China can be traced back to 1994, have experienced three waves of constructions and are recently used to address the residential problems of low- and middle- income households in urban areas. As a pilot city, Guangzhou's intensive construction of social housing blocks was designed to benefit the living conditions of substantial numbers of local families. Despite the substantial benefits, there also appear to be certain unintended consequences, which may affect living conditions and may imply a further lack of socio-spatial resources. Conceptually guided by the "spatial justice theory", this analysis empirically surveyed 660 residents of 13 social housing communities in Guangzhou in greater detail. This study aims to examine whether residents of social housing communities have experienced any injustices regarding the obtaining of physical resources within the city, or any unjust psychological perceptions. Based on three dimensions of spatial justice: territorial distributive justice, economic inequality and locational discrimination, this research has examined three major issues of accessibility of facilities, job-housing relationship and neighbourhood integration.

The results reveal that residents' assessments of services provided by facilities depends largely on the distance to the facilities needed daily, as well as to the quality of basic education, the quality of basic healthcare and the price level of basic commercial goods. The spatial accessibility injustice appear to become more profound with unintegrated and large-size public services like shopping malls, parks and metro stations, in particular in specific communities remotely located or with very short length of residence. Meanwhile, the injustice they are suffering was more likely related to the quality rather than the quantity of the service. To reduce the specific injustices confronted with, more attentions should be given to the quality of services, particularly the basic healthcare and education, especially around Tianhe, Baiyun district and new projects. With regard to the connections between job and housing, a majority of residents has changed their workplaces around the relocated living area after resettlement. No significant evidence was found to indicate that they are suffering from injustice in relation to their current employment behaviour. As residents are mainly engaged in jobs in basic services with low-skill requirements, it would be very helpful to provide more industries involved in basic services in these areas. Finally, social housing residents appear to be effectively integrated into the local environment and they have developed a better network within the community. The combining of theory results with feasible measurements has substantial implications for understanding the pattern of justice in space and for improving the accuracy of housing policy approaches.

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