

At an Extractive Pace: Conflicting Temporalities in a Resettlement Process in Solwezi, Zambia

By Rita Kesselring, Social Anthropology, University of Basel

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Abstract

Mining sites have often been described as enclaves, but the influence of mining companies extends far beyond their fences. I explore the planning and construction of an access road cutting through state and customary land in Solwezi, Northwestern Province of Zambia. For the Canada-based mining company First Quantum Minerals Ltd, the road is an attempt to disengage from the environment (Appel 2014). This both illusory and one-sided attempt to disentangle has re-structured people's lives in multiple ways and integrated even more people into the mine's circle of gravity, though.

The mine's management balances two different planning logics: the overall goal of long-term profitability of the entire company and the much shorter rhythm of fluctuations on the stock market and the need to keep shareholders satisfied. This dual planning temporality creates the extractive pace: the transformation of constantly shifting time horizons into a concrete agenda for today's actions and tomorrow's plans.

Adopting Alfred Gell's (1992) epistemology of time, I show how the implementation of a temporal regime on the environment is one aspect of how mining companies try to disentangle themselves from the economy and politics of their host country. This implementation often has the opposite effect on the local population.

1 Introduction

Canada-based First Quantum Minerals Ltd (FQML) is, through its subsidiaries, the largest taxpayer in Zambia. Its operations span two active mines (Kansanshi and Sentinel mine, extracting copper and gold), a smelter at the Kansanshi mine site, a 16.9% share in the Mopani copper mines (majority-owned by the Swiss commodity firm Glencore) and a decommissioned mine site (Bwana Mkubwa). Since the reopening of Kansanshi mine in the early 2000s and the opening of Sentinel mine in the Northwestern Province in 2015, FQML has induced massive social and environmental changes in the Solwezi and Kalumbila districts. The Kansanshi mine site itself, covering roughly 9,000 hectares, is the clearest expression of these changes. Pits, tailings and fences are not only expressions of current extraction. They involve considerable investment and are perceived as claims for the future (D'Angelo and Pijpers, this issue). Based on expectations for this future, the entire region has seen massive in-migration, and Solwezi has grown fivefold in the past decade to an estimated 250,000 inhabitants (Preuss and Schmidt-Eisenlohr 2016).

Although much of FQML's influence is indirect, the company also exerts direct control over territory beyond the mine site. In this article, I analyse the planning and construction of a new access road by the mine and the associated resettlement process. The new road, which was planned and built by the mine although it cuts through state and customary land, shortens the time and distance between two steps in FQML's production line. It allows truckers bringing copper concentrate from Sentinel mine to the Kansanshi smelter to circumnavigate the messy and congested town of Solwezi, smoothing the mine's workflow and making it less dependent on the town council's planning processes. For the mine, the road is an attempt to disengage its operations from the environment (Appel 2014).

This attempt at disengagement, I argue, is as illusory as it is one-sided. In their efforts to realise the vision of a neat transport corridor disengaged from their environment and separated physically and phenomenologically from the adjacent communities, FQML staff

had to engage to a considerable degree with the human and built environment. This has re-structured people's lives in multiple ways and integrated even more people into the mine's circle of gravity.

Along with Appel (2014), I seek to throw light on the process of disengagement and its effects, and thereby challenge the assumption that mines can operate as "enclaves" in their host society (cf. Ferguson 2005). Similar to what Appel describes in her article *Walls and White Elephants* for Equatorial Guinea and the corporate oil producing sector, the current ruling party in Zambia (Patriotic Front), just like its predecessors, requests mining companies to share the responsibility for the development of the country, while the large mining companies try to disentangle themselves from the country as best they can. As she notes, this disentanglement – the attempt to separate what is empirically entangled through institutional, regulatory and personal connections – requires continuous work. To make the separation between corporate and public responsibility look neat, companies mobilize a number of techniques of internalization and externalization (Callon 1998).

Appel focuses her analysis on infrastructure and how the extracting industry at large practices framing projects – despite its "utter intercalation" with that "which is outside its walls" (2014: 445). Building on Appel's work and on D'Angelo and Pijpers' concept of *mining temporalities* (this issue), I argue that we can better understand the work of disentanglement by analysing the temporal logic of the mine's actions. The planning horizons and internalized time-maps of mine employees shape their engagement with the world beyond the fence and are an important medium for extending the mine's influence. To conceptualize "the potential conflict and non-synchronicity of mining temporalities" (D'Angelo and Pijpers, this issue), I adopt Alfred Gell's (1992) notion of an anthropology of time. He calls on anthropologists to work towards "the reconstruction [...] of the schemes of temporal interpretation, or internalized time-maps, of the ethnographic subjects" (1992: 240). In order to navigate time, people produce a variety of time-maps. Although these maps can vary

widely among different actors, and people hold multiple, continuously changing maps, they are all based on some causal notion of actions and are thus geometric (1992: 190). Furthermore, they shape personal experiences of time but also structure people's actions (1992: 240). However, they necessarily are social constructions and only representations and thus stand in a partial relationship with the passage of non-human time (1992: 240).

Using the work of Gell, I argue that members of the FQML mining complex – made up of a diversity of actors spanning the board of directors, subsidiary companies, management, divisions, departments, consultants, and individual employees – construct time-maps in a way that privileges the interests of shareholders and employees. They try – and frequently manage – to impose imperatives stemming from these temporalities on people who are not part of the mining complex, people who live at the site of extraction with often very different temporalities.

Analysing conflict between competing time-maps is crucial for any analysis of power (Bear 2014). Through understanding the “politics of time” (D’Angelo and Pijpers, this issue) and the institutional bases of dominant ways of structuring time, we gain crucial insights into the workings of power imbalances in general. With this in mind, I examine the dominant temporality of a major corporate actor, the biggest employer in the area under scrutiny and the largest taxpayer in the country; I then examine how the company imposes this temporality on the mine’s social and physical environment.¹

2 The Extractive Pace

The FQML mining complex is part of a global production network driven by shareholders, traders (Miyazaki 2003; Zaloom 2009), rates of profit and investment (Ho 2009), and commodity prices. Its planning horizon is shaped by the overall goal of long-term

¹ In his article on boaters’ time-maps in the waterways of London, Bowles (2016) gives a good example of resistance to a dominant time-map.

profitability of the entire company. The life span of the mine, the amount of investment, the willingness to spend money for projects, and the interpretation of the political situation in the country are all evaluated in their relation to this goal. Management's ability to pursue their aims, however, is crucially affected by the much shorter rhythm of fluctuations on the stock market and the need to keep shareholders satisfied. FQML thus needs to balance two different planning logics and accept trade-offs between short-term and long-term aims. This dual planning temporality is crucial for the mining complex's temporal regime (see D'Angelo/Pijpers, this issue).

The duality in the mining complex's temporal regime creates what I call the *extractive pace*: the transformation of constantly shifting time horizons into a concrete agenda for today's actions and tomorrow's plans. The temporal regime defines the conditions under which the extractive pace is set (and its implementation adapted to concrete circumstances). The temporal regime is shaped by the rhythms of capital (Bear 2014) and is slow to change. Should labour one day take precedence over capital and workers' wages replace dividends as the defining measure of corporate success, the mine's temporal regime would shift. The extractive pace, however, can take many forms. Depending on global economic factors and local circumstances, mines can be developed quickly, or they can be put on maintenance or shut down, only to be reopened when prices pick up. Such changes do not affect the mine's temporal regime, but by changing the extractive pace, they can have lasting effects on the lives of people living around the mine and affect their ability to determine their own temporal regimes.

Implementing their temporal regime through the application of an extractive pace on the environment is one aspect of how mining companies try to disentangle themselves from the economy and politics of their host country as well as from people's everyday life (Appel 2014). To show how this effort affects local populations, I use an example in which the company was largely successful. In Solwezi, this is the rule rather than the exception.

This article is based on 18 months of ethnographic field research in Solwezi town and the wider region between 2013 and 2018. My interlocutors and informants were people in the management and different departments of FQML's subsidiary Kansanshi Mining Plc (KMP), representatives of the Solwezi Municipal Council, traditional authorities who are the guardians of most of the land outside Solwezi town, ordinary town dwellers, and villagers who find themselves at the fringes of a rapidly expanding town.

3 First Quantum Minerals in Zambia's Northwestern Province

Through its subsidiary Kansanshi Mining Plc (KMP), FQML holds an 80% interest in Kansanshi Mine, the biggest copper mine in Africa by output. It sits in the centre of the "New Copperbelt", situated 150 to 200 kilometres west of the older Copperbelt towns of Kitwe, Mufulira, Chingola and Luanshya. Today's open pit mine replaces an earlier shaft mine that was opened in 1908 as the first industrial copper mine in today's Zambia, but that was either closed or running on very low capacity through most of the twentieth century. Linked to the mine, the colonial administration opened an office 10km south of Kansanshi mine, around which Solwezi town developed as a small administrative centre. Some years before Zambia's independence in 1964, the town became the provincial capital of the Northwestern Province, which it still is today.

Mines were nationalised after independence and became an important source of revenue; when global copper prices dropped, shrinking profits left the state budget in shambles. In the 1990s, under pressure from the IMF and the World Bank, the Zambian government started to reprivatize the mining sector and many of the country's other assets. Once the mines were in private hands, the global mineral boom of the 2000s led to new foreign direct investment, much of it in the mining and construction sector. For most Zambians, re-privatization and economic liberalization brought insecurity, increased casualization of employment, reduced wages, and fierce competition for the few jobs left in a

highly mechanized mining industry (Fraser and Larmer 2010; Fraser and Lungu 2007; Mususa 2010).

As mining jobs became scarcer in the Copperbelt towns and across the border in the Democratic Republic of Congo (Rubbers 2017), FQML's arrival in the Solwezi District in the early 2000s and the re-opening of the Kansanshi Mine spurred massive in-migration from urban and rural areas. From around 50,000 inhabitants in the early 2000s, Solwezi town has grown to an estimated 250,000 inhabitants (Preuss and Schmidt-Eisenlohr 2016). The town's infrastructure, however, has not kept pace with this growth. The Northwestern Province was neglected by successive post-independence governments (Peša 2014), and even today, Solwezi is still not connected to the national railway network, while the electricity grid has only recently been expanded beyond Solwezi. Apart from many new and often informal residential and commercial areas, the most visible infrastructural changes are shopping malls (Negi 2014), a new civil centre, and a private golf estate for the mine's management and expatriates.

Further west, in the Kalumbila District, two copper mines have subsequently opened: Lumwana Mine in 2008, today owned by Barrick Gold, and Sentinel Mine, fully owned by FQML, in 2015. Around these two mines, a slightly different variant of urbanization unfolds, since they were constructed as greenfield projects in rural areas (Kesselring 2017: 98-99).

Faced with rapid population increase and a never-ending stream of trucks transporting copper concentrate, blisters, anodes and cathodes, Solwezi's roads are decaying faster than the central and local governments manage to repair them. KMP, partly as "good-will" measures and partly in lieu of tax payments, rolls out sporadic and highly selective maintenance programs administered through its Corporate Social Responsibility (CSR) Department. They are often poorly integrated into the national development plan, and apart from putting some moral pressure on the mines, neither communities nor the state manage to control the delivery of these services (cf. Frederiksen 2017).

As throughout the 20th century, boom and bust are never far away from each other (Pijpers 2016), and their cycles change the extractive pace (cf. Wiegink, this issue). In 2015, the Zambian economy felt the consequences of China's slowing demand. The slump in global copper prices triggered the closure of a mine (Luanshya) and the decision to put others on maintenance (Mopani Copper Mines). Within a few months, the national currency Kwacha depreciated to half of its value, and prices for many products rose steeply. Against the trend, the three new and comparatively competitive mines in Northwestern Province remained open, and KMP continued with the construction of a smelter, which started to process concentrate in 2015.

Insert Figure 1: Kansanshi's processing plant with the smelter in the background, Solwezi, Zambia, February 2018 (photo taken by the author)

4 The Smelter Road

Solwezi town has one primary road, the T5, which cuts across dense settlements and the centre of town (see Figure 2). The T5 is the main west-east highway in Northwestern Zambia. It connects Mwinilunga and Angola in the west to the Copperbelt Province in the east. Transporters carry the copper produced at Kansanshi mine through the main gate, head south and turn eastwards into the T5 towards the harbours. These trucks avoid the congested town centre. However, trucks carrying copper from Lumwana and Sentinel mines have to drive right through Solwezi town. They increase congestion and risks to pedestrians and marketers selling the produce along the road and routinely get stuck in traffic.

Insert Figure 2: Map of Solwezi Town, Northwestern Province, Zambia, drawn by the author

With the prospect of processing both Sentinel's and Kansanshi's copper concentrate and against the relative lack of smelter capacity in Zambia, FQML built a smelter on the Kansanshi license area. It is designed to produce over 300,000 tonnes of copper and 1 million tonnes of sulphuric acid per annum (FQML 2016: 18). Since the smelter's commissioning in March 2015, most of Sentinel's copper concentrate is processed into anodes at the Kansanshi smelter. To accommodate the resulting traffic, FQML built a new access road on which trucks coming from Sentinel can reach the smelter without entering Solwezi centre. The smelter road thus relieves traffic congestion and noise pollution in the town, leaving only the trucks from Barrick Gold's Lumwana mine to cut through its centre.

Insert Figure 3: Trucks cutting through Solwezi town, August 2017 (photo taken by the author)

FQML's road division built the smelter road between 2014 and 2015. In 2018, the smelter road is still very unlike any other road in the country. It is seemingly built to last, without a single pothole, and with no shops or stands alongside it. Along with Zambian regulations, FQML enforced a 100m road corridor to avoid accidents should truck drivers lose control over their vehicles. Along most other roads in the country, stands and shops are put as close to the road as possible, and the buffer zone is usually not policed. Due to its perfect state, driving on the smelter road differs from any other bodily experience of driving on Zambian roads (Mrázek 2002). The legal speed limit is 80 km/h, but even in my old Hilux I am tempted to go much faster.

FQML plans to hand over the road to the Zambian Roads Development Agency for public use, but while the municipal council has processed the transfer of ownership, the road was not yet published in the Gazette. At the time of writing, between 50 to 100 trucks per day thunder along the smelter road, a number which is expected to double in the near future.

Insert Figure 4: Truck driving along the smelter road after offloading concentrate at Kansanshi's smelter, July 2016 (photo taken by the author)

FQML built the smelter road to disengage itself from its environment. Trucks can now be offloaded in the newly built smelter without getting stuck in the bottleneck of a congested town. Planners envisioned the road as a friction-free corridor between extraction and processing. All infrastructure, however, is necessarily embedded in time and space. As a consequence, any attempt to disengage from the environment has to engage with it in order to be effective. Disentanglement by infrastructure creates new entanglements. These new entanglements, however, can be more tightly controlled by those who define the planning process and set the rules of engagement.

In what follows, I detail the history of the road, the mining complex's planning logic, the standards it refers to and its engagement with emerging challenges. Despite some hick-ups, the mine was able to inscribe its temporal and spatial logic onto its social and physical environment. The mine remains entangled with its environment, but was able to reshape the concrete forms this entanglement takes. This allows the mining complex to keep up its own temporal regime and to perfect the extractive pace resulting from it, while forcing others to adapt their temporal logics.

5 Planning the Smelter Road

The smelter road is 11.1km in length and cuts through municipal and customary land. On the first 1.8 km, it follows the previously existing unpaved Kazhiba Road (U5). The remaining 9.3 kilometres were planned, designed and constructed by the mine. The road swirls around the uninhabitable swamp of Kimasala Dambo, after which it runs parallel to a high voltage power line. It crosses agricultural fields, passes close to a school, temporary farm

shelters and residential houses, and cuts two earth roads and two streams, Kyamanda Stream and Solwezi River. The road spans across the community boundaries of Kalepa and Muzabula, administered by two group leaders, both of whom fall under the traditional authority of Chief Kapijimpanga, the highest traditional authority in the area. Group leaders report to the chief through a sub-chief or a headman.

In 2013, while KMP negotiated with the acting Chief Kapijimpanga of the Kaonde people for land to build the smelter road, the municipal council, against a context of excessive backlog and demand for houses and plots, also acquired land from the chief in the same area.² It identified, surveyed and partially serviced a 4.2ha area for a residential settlement called Humphrey Mulemba Villa Park (with future expansion plans for a 14-hectare low and high cost estate). Both plans conflicted with each other, and KMP refused to re-align the road with the Council's plans, as this would have meant to extend the road by several kilometres. Today, the smelter road cuts right through the planned (and partly informally developed) residential area.

The two area plans – the smelter road and the Humphrey Mulemba Villa Park – followed different planning rhythms. The people implementing the mine's plans did not tire of telling me that they wanted to move quickly and “get things done”. They perceived the town council's attempts to control their actions as unnecessary and useless red tape hampering economic development. The council was bound to cumbersome and complex planning processes, slowed down by the emergence of informal settlements and land disputes, and rather stoically pursued an institutionalized pace adapted to a logic of procedure and budgetary planning rather than emphasis on a quick outcome.

When land for planned developments is secured on the local level, central governmental bodies such as the Ministry of Lands and Natural Resources get involved.

² This area should long have been integrated into the municipal area as part of the Integrated Development Plan of Solwezi Municipal Council of 2008. However, due to the succession struggle within the Kapijimpanga Chieftaincy, the plan has not been signed off by all necessary parties.

Before the Ministry of Lands approves a development project, the developer has to commission an Environmental Impact Assessment (EIA) and submit its final report, the Environmental Impact Statement (EIS), with the Zambia Environmental Management Agency (ZEMA), a statutory body within the Ministry, for review and approval. In the case of the smelter road, KMP commissioned the consultancy firm URS Corporation to prepare the EIS. The firm conducted an environmental and social baseline study of the project area, considered (and dismissed) alternatives, and presented the potential environmental and socio-economic impacts of the project in terms of magnitude, significance and duration.

Part of ZEMA's requirements for approval of the EIS is the submission of a Resettlement Action Plan (RAP), like the EIS an internationally standardised procedure drawing heavily on the International Finance Corporation's Handbook for Preparing a Resettlement Action Plan (2012). KMP commissioned InterSocial Consulting (2013), an international consultancy firm advising companies on land access and resettlement. The firm found that the planned road affected 83 households and that the project area would amount to 81 hectares of farmland, part of an area of farms that covered a total area of 214ha. Farmers' loss due to the 100-meter corridor would include agricultural land, cultivation potential, annual and perennial crops, fruit-bearing trees, two homesteads, and many non-residential structures such as sheds, wells, and temporary farm shelters. Most of the farmers have their homestead or house in the adjacent villages; some live temporarily on their farms when harvesting. The EIS and the RAP were approved by ZEMA, and in 2014, FQM's road division started to work on the new access road, resettling and compensating farmers according to the RAP.

In all these steps, the companies followed a planning logic defined by what they saw as international standards of engagement with local communities. The consultancies' timelines were defined by the mine's terms of reference. Their progress was judged not in accordance to local circumstances, but in comparison to similar cases around the world –

similar, that is, in the eyes of the mining complex and the consulting firms. They engaged the mine's environment, but they did so on terms defined without any concrete reference to it, introduced to facilitate the extractive pace, not local agendas.

6 Compensation and the global copper price

Most of the affected area was farmland, divided into plots of one to three hectares each. The farmers produce food crops for household consumption and sell the surplus in local markets. Typically, a household receives a plot of a size household members can effectively farm. Farmers do not hold freehold title to the land, but are granted the land for use by the local headman or headwoman. On average, a family grows one to two *lima* (0.25ha) of maize, one *lima* of potatoes and one *lima* of groundnuts. Affected land was compensated with alternative land (if held under customary tenure) or financial compensation (titled land); and crops were compensated according to market rates determined by the Ministry of Agriculture. Built structures were valued and compensated financially or with a replacement. However, for the resettlement scheme, the mine's CSR Department could not rely on a national standard: the first National Resettlement Policy was only released in October 2015 by the office of the Vice President. Thus, KMP's CSR Department closely worked with the headmen and groups leaders for the allocation of alternative land.

As compensation for land and structures, farmers could choose between a new piece of land, adjacent if available or somewhere nearby, and monetary compensation. The mine's CSR department, however, was set against monetary compensation and tried to avoid paying out cash. Money, KMP staff explained to me in multiple conversations, was much less secure and sustainable for farmers than land.

In addition to new land, KMP provided every resettled household with fertilizer and lime, and with enough maize and groundnuts seeds for 1 *lima* of each crop. The compensation was initially scheduled for three consecutive years after the resettlement, starting in 2014. In

2015, however, the mine unilaterally decided to shorten the compensation program to one year, blaming the decline of global copper prices and the government's decisions to raise mining taxes. Resettled farmers strongly criticised this decision in conversations I had with them. It turned, they felt, compensation, an entitlement, into a charitable gift dependent on the giver's goodwill. CSR representatives were not too happy about the measure either, but accepted it as a normal change of heart by a mining company. CSR activities rank lowest in the mine's priorities when it comes to budget discussions, and the CSR manager always has to make a strong case for extra expenditure in times of low global copper prices (cf. Rajak 2011; Welker 2014). In the instance at hand, it made sense to the mine to adapt the extractive pace to the market environment by, among many other measures, cutting the CSR budget and concentrating on the mine's core tasks. This internal decision, however, had external consequences for hundreds of farmers, forcing them to conform to the mining complex's temporal regime and upsetting their planning horizons.

KMP's CSR program also provided training that framed the resettlement as a change to adapt farming livelihoods to a more sustainable model. Compensated farmers were put on a financial training program which purported to teach them how best to spend windfall money by investing it wisely. They also underwent agricultural training in conservation farming methods to replace the widespread slash-and-burn practice, part of the Conservation Farming Programme FQML implements through its CSR programmes. This training advocates farming methods that require fewer inputs and minimal tillage,³ drawing on Western ecological farming models on the one hand and the increasing scarcity of land on the other. Typically, small-scale farmers in this area of Zambia shift their fields when the soil is exhausted, but urbanisation has turned land into a scarce resource in the area adjacent to Solwezi, so farmers have to cultivate their land for more consecutive years than before. This

³ On the contagious issue of Conservation Agriculture and its limited adoption by smallholder farmers in Southern Africa, see Andersson and D'Souza (2013).

change in shifting cultivation practices requires intensification of farming methods and a different temporal regime linked to the use of hybrid maize seeds.

Agricultural trainers and CSR employees invariably advertise conservation farming as *sustainable*. Farmers, the logic goes, can keep making a living and better preserve their way of life if they adopt new techniques. Resettlement is framed as a chance to adapt and live in a more sustainable way. Through promoting conservation farming and educating resettled farmers in this way, the mining company worked to disentangle itself from its environment, selectively engaging with the people and land around it. Far from acknowledging the massive changes brought by the mine and engaging with them – including a new road that increases in-migration and exacerbates land scarcity – the mine uses conservation farming programmes to shape farmers as a target for its actions. In this process, it imposes its own temporality on others.

7 Managing

Farmers underwent multiple trainings during the years of 2014 and 2015, and the CSR team regularly checked on their progress. In compliance with International Finance Corporation standards, it conducted a final resettlement survey in early 2015, in which it documented the progress of the resettlement farmers. I joined the field team of the CSR Department on multiple occasions during their days in the field. With a GPS device, they measured the replacement land of each and every farmer and filled in a questionnaire on their harvest and the inputs used. This was done by Zambians casually employed by the CSR Department. When some more serious complaints were raised, KMP's Resettlement Supervisor, a young, white South African, Andrew [name changed], usually stepped in. One day, we were driving in his car when he received a call from one of his team members in the field. An elderly man's household had been removed from the road corridor to a new place just a couple of meters away. At the time of the call, the builders were about to finish the new

house and to build a new pit latrine. According to the standard the Resettlement Unit applied in all its resettlement areas, latrine shelters are built over a two-meter deep hole.

Insert Figure 5: The old and the new house including the new pit latrine, May 2015

The man, the team member reported to Andrew on the phone, wanted his pit latrine six meters deep instead of the planned two meters – could Andrew advise him what to do? Andrew responded that six meters were too deep. ‘That is below the water level and the latrine will pollute the groundwater’, he said. ‘Let him have a three-meter hole’. After hanging up, however, he reconsidered and called back: ‘No, let us stick to the two meters; I will be with you shortly.’

We swung down the first slope of the smelter road to find the elderly man, his blind wife sitting in front of the old house, two construction workers busy with the windows of the new house, and two members of the CSR team conversing with the elderly man around a two-meter deep, one square meter wide hole. Andrew joined them and explained to the man through a translator that the groundwater would be affected if the pit was six meters deep.

After five minutes, the man nodded; he agreed to the two meters. Andrew told me later: ‘You have to talk to them as human beings. They think they are played wrong when they have had a six-meter hole and now we want to restrict them. But when you explain it, they see that you are only applying standards. You need to educate them; it is a problem of education.’

This scene illustrates the resettlement team’s image of their work. They situate themselves between internationally tested and valid standards on the one hand and local expectations on the other hand. Since the standards are there for a reason, they can be explained to every rational human being, and as long as you are patient and firm enough, most

of them can ultimately be convinced. Sometimes the engineers even consider compromising on certain standards, as long as they do not find a technical argument against it.

Back in the car, I mused: ‘So, this couple now lives at a highway to-be’. Upon which Andrew responded, all in all pleased with the resettlement: ‘Yes, it is good that they are not moving to another place. The woman is blind and she would be lost somewhere else. Now she knows the neighbours.’

In his comment, Andrew systematically erased the massive and accelerated change the new road will bring to the environment. His job was to implement the Resettlement Action Plan and to mitigate the consequences of resettlement. The closer the new home could be built to the old one, the easier resettled people would adapt. While he took the bodily emplacement of people in an area into account, he tied them to a place that is no more (Askland, this issue). His aim was to get his job done with a short-term agenda, reacting to problems on a daily basis: in this, he ignored the massive long-term changes people will have to deal with long after his assignment is finished.

As pointed out above, in the EIS, trees, air quality and people are valued and treated with the same scientific perspective. The consultancy firms adopt standards and strategies from natural sciences while aligning them with the national regulatory body. The resulting EIS and the RAP then become the roadmap for implementation and mitigation of the impact of resettlement. The governmental body ZEMA adds the logic of bureaucratic standardization and further translates the technical and materialistic gaze from the physical environment onto the social-economic environment.

With this scientifically informed “manual”, the CSR Department tries to mitigate what planners and developers have done. The implementation of a master plan always involves numerous adaptations to the environment on site (Suchman 2007: 70). Such adaptations are not meant to change the plan, but to enable its implementation in different environments. Here, again, the CSR Department considers itself successful when it manages to mitigate the

short-term consequences of long-term processes. Just like road building, resettlement is a finite project, and planners move on to different things while residents continue to deal with the long-term consequences of planning.

Just like conservation farming, the standard pit latrine is emblematic of the ways in which the mining complex seeks to disengage from the wider environment. The CSR Department is anxious to uphold the perceived status quo ante for the affected communities. Where that is impossible (because, say, you cannot plant maize on a tarred road or in an open pit mine), the aim is to ‘mitigate’ the consequences. To this aim, it applies standards it recognizes (having defined some of them itself), and ensures their successful implementation through creative, contextualized actions and engagement. These actions are based on the premise that short-term effects of large-scale mining projects must be duly cushioned and that ‘local customs’ should not be interfered with. For instance, the EIS report is relieved to conclude that ‘no loss of ethnicity (culture/traditions) is expected to arise as a result of the proposed access road project’ (URS Scott Wilson Zambia 2013, 78). The CSR Department thus applies a duality to one world: industrial development for the mining complex, ‘culture’/‘tradition’ conservation for the communities. By constructing this duality, it can conceptually disentangle its actions from their consequences. This attempt to disentangle involves the reshaping and creating of new entanglements, though, which directly affect the temporalities of those whom technocrats refer to as PAPs – *Project-affected persons*.

8 Lasting consequences for farmers and residents

Those who farm and dwell along the smelter road typically take very different temporal perspectives than planners and CSR staff. Farmers experience the new structure against the background of a stock of knowledge they have acquired by living and farming in the area for a long time – sometimes for generations, as many have inherited the right to use the land (cf. Luning and Pijpers 2017). Their homes and homesteads are in a nearby village

that is rapidly transforming into a densely populated suburb of the mining town. They have witnessed and partly participated in Solwezi's growth, and are of course fully integrated into the cash economy. Nevertheless, their main asset on which they base their participation in that economy is still the land and the more or less unconditional right to its use.

Insert Figure 6: Women waiting for their fields and crops to be measured as part of the resettlement survey, April 2015

The new road has opened up some opportunities to the households whose farms were affected by it. Some farmers were hired as unskilled labour during the construction phase. Women crushed stones as construction material, and were paid to sweep the road clean after the construction vehicles had finished their work. Some minibus services have adopted the smelter road as an alternative way into town that avoids the bumpy dirt road through the compounds. Most farmers, however, still save the money and walk along the road instead of taking a minibus; women carry their produce on their heads, men push bicycles with high loads of charcoal to sell to urban dwellers, and many return from a day in the field with their hoes shouldered. In spite of the advantages the new road brings to some farmers, most still see it as an encroachment on their ability to foresee and plan their own lives. In what follows, I describe three processes that have directly followed from the construction of the road: differentiation, intrusion and commercialization. In all three, different time-maps come into conflict and the mining complex's actions largely force the farmers to adapt their temporalities.

8.1 Differentiation

The mitigation and compensation program was only intended to benefit the abutting farmers and residents. The program's aim was to neutralize the effects of the new road on

those directly affected. This, however, introduced a distinction that had the opposite effect. Instead of neutralising the road's consequences, the program created social differentiation, and thereby multiplied the effects of the road.

The CSR's Conservation Farming Programme puts the abutting farmers on trainings in conservation techniques. This creates a chasm in status and in practices. During the resettlement survey for which I joined the CSR team, one farmer, who came in neat clothes and shiny shoes straight from his work in town, not expecting to walk the boundary of his farm with us, complained bitterly about his envious neighbours. In contrast to his adoption of conservation farming, they still slash and burn right after harvest. It concerned him, he said, because sometimes the fires do not stop at the boundary of their farm. He once lost a *lima* harvest due to their practice, and as a result was considering how best to construct a fire buffer.

The man's perception of threat and envy is indicative of the differentiation the smelter road has created between those abutting the smelter road and other farmers. The mitigation and compensation program does not neutralize the road; it is overly productive of differences.

8.2. *Intrusion*

A new trade route typically changes transaction costs and settlement patterns (Beck 2013). Along the smelter road, anticipated changes have attracted a number of newcomers. Some newcomers have emerged as profiteers of the new situation, and disputes between newcomers and long-time owners around boundaries, ownership and tenancy are frequent. For instance, a farm owner who could not be present when the CSR Department undertook its initial survey a couple of years back appointed a representative to act in her name; instead, the person had the land registered in his own name and today occupies the land. Such conflicts show that the new road changes the value people attach to the land around the new road. Newcomers typically do not value the land for its agricultural capacity, but for its residential

and commercial potential. Whether farmers use conservation farming methods or not, a farming lifestyle has become less sustainable around the smelter road. Theft of farmers' produce has increased, and many farmers complain about thieves who are attracted to their fields, especially before harvesting.

In spite of better connectivity to town, land conflicts often make it less easy to combine farming with other activities. Since effective occupation is an important means of establishing rights to land, land conflicts make it more important to physically occupy and fence in one's land.

The smelter road has economic and social effects that selectively privilege temporal and spatial regimes different to those associated with subsistence farming. While the mine's CSR Department hopes to make farming more sustainable through its resettlement programme and training measures, the actions of most divisions of the mine undermine this sustainability. A large part of the effects are indirect: mining does not make farming impossible but creates an incentive structure that privileges other activities. Whether or not this will be beneficial for Zambians in the long run, it directly alters people's chances to live according to their own time-maps.

8.3 Commercialization

The road has not only increased the value of the surrounding land and created competition over land resources; by creating demand, it has also helped to transform the fields into tradable assets evaluated according to their commercial value.

Since the construction of the road, the town has visibly grown westwards as a large part of the land along the smelter road has been rapidly built up with residential and commercial structures. In particular, the road has accelerated informal urbanization processes. Farmers told me that they do not feel protected by the chief from squatters and developers. An ongoing succession dispute triggered by the passing of the previous Kapijimpanga chief in

2008 means that the current acting chief has not been officially confirmed and keeps a low profile. Because he fails to intervene in land disputes, a group leader feels safe in selling the same pieces of land to different people. As long as the leadership dispute is not settled, land in the Chief's area cannot be transformed into town land; this means that the town council has little willingness and capacity to step in forcefully enough to secure tenure rights.

The new road has thus induced processes that at first sight cannot be attributed to the visible, material infrastructure (Harvey and Knox 2015, Larkin 2013). The road and the adjacent communities were quickly absorbed into the Solwezi 'hot-spot' (Pijpers 2016: 507). This has further accelerated processes of urbanization and social differentiation. Commercialisation and tenure insecurity have already led to land alienation and out-migration by farmers. Here, as well, efforts by the mining complex to disentangle its operations from their environment have created a more pronounced entanglement – albeit one that can more easily be ignored by the mine. The mine's efforts to define its own temporal logic and to pursue its extractive pace have privileged a different temporality and a different pace in its environment.

9 Conclusion

CSR programs and the resettlement process are part of a larger strategy employed by the mining complex to keep up the extractive pace. The mining complex derives its power to pursue its extractive pace in an unhindered manner from relegating those outside the mining complex to a time-map disconnected from its own. In its communication with farmers and residents, it presents itself as separated from their lives. If the mining complex could draw people's time-maps, the mine as a pace-setter would not figure on them. The mining complex thus pursues a boundary-making project (Welker 2014) in which it, firstly, relegates farmers to a time outside of the present time (Kirsch 2014, D'Angelo and Pijpers; Wiegink, this issue) and, secondly, discursively eclipses itself as a governing actor from the past, the present and

the future of the region and the country. In the mine's time-map, farmers and residents do not figure as a driving element; if anything, they figure as potential stumbling blocks.

Farmers and town dwellers, however, have by necessity tried to synchronize their actions with the dominant temporality of accelerated change as it has unfolded since Kansanshi mine was re-opened fifteen years ago. Through a variety of strategies such as the pursuit of higher education degrees, the search for dialogue with the CSR Department, participation in local content business courses, but also, as described above, the adoption of new farming methods, people try to attune their lives to the mine's temporality.⁴ The constructed and lived time-maps produce non-synchronized temporalities.

In reality, the mine and Solwezi residents are of course part of one 'social field' (Gluckman 1961). The non-synchronicity between the different time-maps produces externalities (Bear 2014, Callon 1998) such as further social differentiation, intrusion and commercialization of land. These externalities, and many others, are the costs of extraction for which the mining complex does not assume responsibility. The mining complex achieves planning security for itself and catapults other actors into planning insecurity precisely because it is entangled with the people living at the site of extraction. Mining companies and their shareholders, however, are not only entangled – and therefore, according to Callon (1998: 19), indebted to the people – they owe much of their profit to those onto whom they externalize the costs of extraction.

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⁴ It is thus not a situation of "overheating" (Eriksen 2016), that is the phenomenon of "unevenly paced change where exogenous and endogenous factors combine to lead to instability, uncertainty and unintended consequences in a broad range of institutions and practices, and contribute to a widely shared feeling of powerlessness and alienation" (2016: 16; cf. Pijpers 2016). Although processes of inclusion and exclusion unfold dramatically, feelings of powerlessness and alienation are not widespread.

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