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A miner's canary in eastern Congo: Formalisation of artisanal 3T mining and precarious livelihoods in South Kivu

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ABSTRACT

Numerous initiatives are currently trying to reform eastern Democratic Republic of the Congo's (DRC) ill-reputed artisanal and small-scale mining (ASM) sector through formalisation, traceability, and certification of the region's trade in tantalum, tin, and tungsten (3T). While this ethically driven impetus derives from consumer pressure following numerous reports on the militarisation of the area's ASM sector and concomitant human rights abuses, the ability of the resulting initiatives to address these problems remains unclear. In this paper, we blend qualitative and quantitative methods to generate insights into two questions: how has the formalisation of eastern DRC's resource markets, through traceability and certification, altered the socio-economic dynamics around artisanal mines and trading routes? What is its actual impact on the everyday life of miners, their families, and associated professions? Based on in-depth research in South Kivu – a pioneer province for traceability and certification – we demonstrate the ambiguous outcome of these reforms so far and analyse how a threatened and jeopardised informal ASM sector – much in the fashion of a proverbial 'miners' canary' – sends an alarming signal in regards to the livelihoods of some of South Kivu's mining communities.

Keywords: Democratic Republic of the Congo, artisanal mining, formalisation, development, conflict, political economy.

1. INTRODUCTION

In eastern Democratic Republic of the Congo (DRC), an area known for chronic instability and insecurity triggered by cyclical violent conflict (Stearns, 2011; Ndaywel è Nziem, 2009; Vlassenroot & Raeymaekers, 2004), debates in the past 15 years have orbited around the presumed role of tin, tantalum, tungsten (3T) and gold in the nurturing of violent entrepreneurs (Cuvelier et al., 2014a; Jackson, 2002; United Nations,

2001). Furthermore, a concomitant outcry through media and advocacy organisations since the early 2000s – epitomised by a campaign called ‘no blood in my mobile’– further helped to trigger the still ongoing transformation of mineral supply chains in the frame of transnational regulation piloted by foreign and domestic governments as well as international industry.¹

Based on the premises of the ‘greed hypothesis’, as put forward in the seminal work of Collier and Hoeffler (2002), and whose claims have since been deconstructed by numerous scholars (Korf, 2006; Nathan, 2005; Cramer, 2002), initiatives to regulate the eastern DRC’s mineral supply chains have increasingly gained traction. While intense debates ask whether or not such intervention can help to curb violent conflict in the region (Cuvelier et al.; 2014b, Autesserre, 2012; Johnson, 2013; Seay, 2012; Nest, 2011), little systematic attention has been paid to the specific conjunctions of ‘conflict-free’ sourcing schemes and local livelihoods of artisanal and small-scale mining (ASM) communities, despite the fact that the Congolese ASM sector sustains an estimated 200,000–550,000 workers and 1–4 million dependants (Hilson, 2016: 548; PACT, 2010: 6).² Instead, the focus of mineral reform mainly revolves around a push to eliminate – by way of formalisation – the perceived ‘illegal’, ‘inefficient’, and ‘primitive’ practices assumed to have constituted eastern Congo’s ASM markets:

Official state policies, transnational governmental organizations, and international legal frameworks typically portray illegal activities as being bereft of moral value, economically inefficient, [...] and the expectations of modernity wrapped up with its social, political, and legal construction. (Panella & Thomas, 2015: 3)

As opposed to certain industry³ and advocacy (Enough Project, 2014) claims, we argue that, intentionally or not, the incompatibility of ASM with corporate-regulatory structures prevents a purely positive impact of trace-ability and certification on local production and trade. In some cases, human rights violations and extreme poverty are perpetuated into the era of ‘ethical sourcing’ (Rothenberg, 2014). Moreover, the normative ideological idea to clean up the region’s supposedly illicit mineral trade obfuscates the fact that local resource economies, in South Kivu like elsewhere in the DRC, are embedded in a fine-grained web of complementary relations and regulations (Geenen, 2011). This speaks to Panella and Thomas’s claim that:

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¹ The most crucial ones are the OECD due diligence guidelines at <http://www.oecd.org/corporate/mne/mining.htm>, the ITRI tin supply chain initiative at https://www.itri.co.uk/index.php?option=com_zoo&view=frontpage&Itemid=60, and section 1502 of the US Dodd-Frank Act at <https://www.sec.gov/about/laws/wallstreetreform-cpa.pdf> (all accessed 30.06.16). According to its website, OECD due diligence guidelines provide “detailed recommendations to help companies respect human rights and avoid contributing to conflict through their mineral purchasing decisions and practices”. The ITRI tin supply chain initiative is a bagging-and-tagging system put in place by the international tin industry body ITRI, allowing for legal trade in tin, tantalum, and tungsten (3T) minerals. Section 1502 of the Dodd-Frank Act requires companies registered on the US stock market to report on an annual basis whether their minerals have been sourced from the eastern DRC or neighbouring countries, and if so, whether or not they are financing conflict (Radley and Vogel 2014: 407).

² Discussing the provinces of North Kivu and South Kivu specifically, Geenen and Radley state that “using the World Bank’s methodology of allowing five dependents per artisanal miner, we can project that approximately one to 1.75 million people are dependent on ASM for their livelihood in the Kivu provinces, or nine to 17 percent of the total population” (Geenen and Radley, 2014: 59).

³ See for example www.intel.com/content/www/us/en/corporate-responsibility/conflict-free-minerals.html, accessed March 31st 2017.

Social scientific application of categories such as ethics and legality can obscure the generally fluid movement of subjects and objects across networks of value and contexts of exchange. (Panella & Thomas, 2015: 5)

We substantiate our argument by presenting how corporate and formalised ethical sourcing disintegrates existing complementarities of informal production networks and how their implementation has, for direct and indirect reasons, triggered stagnation and decrease of local prices. Based on extensive ethnographic research on eastern DRC's ASM sector over the past five years, as well as an exploratory quantitative survey carried out in the first half of 2016, we investigate how corporate claims to ethical and responsible mining are inserted into a shifting landscape of regulation. Currently dominated by ITRI's Tin Supply Chain initiative (iTSCi), an industry scheme run by a consortium of key tin producers (Radley and Vogel, 2015; Matthysen and Zaragoza, 2013), we assess how this shifting landscape reshapes local livelihoods.

The iTSCi system is a result of international requirements for companies to demonstrate 'due diligence' when sourcing minerals from conflict-affected areas (following OECD guidelines), and is designed to provide proof of the origin and trading route of the minerals (following Section 1502 of the Dodd-Frank Act). It traces 3T minerals from pit to exportation, at which point regional certification takes over (Verbruggen et al., 2011). In putting plastic tags on the mineral bags – one at the level of the mines and one prior to transporting them to regional trading houses – and matching the respective information on logbooks, iTSCi aims at establishing a closed pipeline supply chain. The system accompanies and supports a push towards ASM formalisation and the enclosure of hitherto decentralised production networks that used to be organised in more fluid ways (Vogel & Raeymaekers, 2016; Mueller-Koné, 2015; Iguma, 2014).

Our analysis focuses on the impact of formalisation, through but not limited to iTSCi, on local livelihoods and economies. We assess the ways in which current developments across South Kivu Province (for more background on the area, see Vlassenroot, 2013) alter the socio-economic dynamics in different mining areas, and how it affects patterns of choice through which local producers (including miners, cooperatives, local traders, and adjacent economic actors) navigate their livelihood strategies (Geenen & Radley, 2014; Cuvelier, 2010). In our investigation into the socio-economic impact of ASM formalisation, we sketch artisanal 3T miners collectively as a 'miner's canary' under stress. Hence, we portray them as a potential indicator to policy-makers and development practitioners regarding how local livelihoods around artisanal 3T mines evolve under the formalisation efforts encouraged and co-produced by mineral traceability and certification in eastern DRC.

In doing so, we focus on the potential perils this particular shape of formalisation can pose to longstanding local economic strategies that help large parts of the population to cope with volatile socio-economic environments in the absence of inclusive development and the persistence of protracted violence and displacement that reduced rural households' subsistence capacity. This helps us to both assess miners' agency and self-perception as well as to draw some wider conclusions relating to dynamics of legitimacy, governance and authority in a transforming ASM sector (see also Bierschenk & Olivier de Sardan, 2014; Meagher et al., 2014; Englebort & Tull, 2013; Raeymaekers et al., 2008; Rubbers, 2007; Lund, 2006).

After outlining our conceptual and methodological framework in the following section, we will introduce our three main study sites. We then subsequently present and analyse the combined results of our

qualitative and quantitative research before establishing the five major dynamics at play. In the closing section, we summarise our findings and propose several conclusions to inspire future research.

2. CONCEPTUAL AND METHODOLOGICAL REMARKS

Recent research on socio-economic characteristics of resource extraction recommends the increased use of mixed methods to “take into account the full range of socioeconomic costs and benefits as well as power dynamics at multiple scales” (Gamu et al., 2014). Taking this into account, we designed an explorative survey exercise to complement our in-depth qualitative research and generate insights into two questions: how has the formalisation of eastern DRC’s resource markets, through traceability and certification, altered socio-economic dynamics around mines and trading routes? And, bearing in mind the region’s history of militarised mining and violent conflict, what is its actual impact on the everyday life of mining communities? In this essay, we define formalisation as the ensemble of deliberate policies, techniques and other undertakings to make people, things and actions in a given field legible to regulatory authority, including both state institutions as well as other actors that claim and acquire such authority, such as iTSCi.

In our analysis, we then match the long-term insights of our ethnographic work with preliminary findings established by survey work. Inspired by over 500 individual interviews and focus groups with multiple stakeholder groups held across different research projects stretching over six years and dozens of 3T mines in South Kivu, we developed an exploratory survey in French and Swahili, consisting of 30 items (see Annex I in Supplementary material). In three specific mining areas that are part of a wider research project, 125 randomly sampled participants responded to this exploratory survey, carried out subsequent to our ethnographic research to control for the respective qualitative data and to inquire if a different methodology would gather different results. The key criterion for random selection was that any respondent, in one way or another, was supposed to be part of the ASM sector of the site in which they participated in the survey. Hence, this includes miners, different kinds of subsidiary professions (washers etc.), local traders, cooperative agents, state agents linked to ASM, transporters, and businesspeople supplying the former. These were randomly selected as to their presence in the mining areas and their consent to take part. Given the limited number of respondents, we do not claim this survey to be statistically representative.⁴

Despite not being statistically representative, given that tens of thousands of 3Tminers work in South Kivu alone, the survey results (see Annex II in Supplementary material) help us triangulating our earlier ethnographic, qualitative fieldwork. In the following sections, we draw both from our 125 questionnaires as well as from our interviews (focusing in particular on those conducted with miners of the same three

⁴ While this sample could be considered a small large-N study, we do not claim it be statistically representative. Random sampling means every individual in the included field sites could participate: surveyors did not target any particular individual or group while in the field, rather they were instructed to have anyone respond to the questionnaire. Illiterate respondents were assisted by surveyors (this can represent a form of bias, but also excludes another form of bias, namely exclusion from the survey based on literacy).

specific mining areas, while also taking into account many others with miners, traders, state services, and other actors). The survey exercise incorporates a diverse range of respondents across different geographical, gender, age, professional, and educational strata. In total, 48 persons responded to the survey in Nzibira, 23 in Lemera, and 54 in Nyabibwe. Sixty percent of respondents are men, 37% women and three percent did not want to specify. Twenty-five percent of respondents were 16–25 years of age, 29% were aged 26–35, 17.5% were aged 36–45, 10.5% were aged 46–55 and five percent were 56 or older. Thirteen percent did not indicate their age. While 47% of respondents were miners, 29% were non-miners doing associated work (including washing and transporting), 10% were traders, six percent state agents, and five percent cooperative agents. Three percent did not specify their job. Out of the 125 respondents, eight percent had gone to a university, 37% had visited a secondary school, and 27% a primary school.⁵ Twenty percent had no formal education and 8% did not respond.

3. BRIEF SOCIAL GEOGRAPHY OF THE STUDY SITES⁶

In this section, we introduce the main study sites where fieldwork for this article has been carried out, both through qualitative, ethnographic interviews and a quantitative survey exercise. While all three sites are key areas in which current formalisation efforts take place, they are also located in South Kivu Province (see Annex III in Supplementary material).⁷ All three mining areas have gradually become part of the iTSCi scheme between 2012 and 2014 until today.

A transit town on the Goma-Bukavu road atop the shores of Lake Kivu, Nyabibwe is one of Kalehe Territory's key tin exploitation areas. Its main site, Kalimbi, hosts two big pits: T20-Maternité and Koweit. While around 1300 miners were registered working in Kalimbi by local mining authorities in 2013, the number has recently decreased due to technical problems, price drops and promising alternative mines in proximity (Matthysen & Zaragoza, 2013). Since around 2010, there have been two mining cooperatives: the *Coopérative minière pour le Bien-être des Communautés de Kalehe* (COMBECKA) and the *Coopérative Minière de Kalimbi* (COMIKA). Early on, the two cooperatives found themselves opposed to each other over the control of Kalimbi, but more recently these tensions have been alleviated. Nonetheless, the cooperatives remain influenced to varying degrees by customary authorities and local politicians. While Nyabibwe used to be controlled by shifting militia groups during the Congo Wars, it has today become the pilot site for a number of conflict mineral initiatives, including iTSCi's traceability scheme (Cuvelier, 2010). Kalimbi was validated and began producing 'clean' cassiterite in 2012 and – despite concerns of continuing military involvement in terms of informal taxation – continues to do so today. Nyabibwe's official cassiterite production has partly benefitted from the supply of nearby non-validated mines. One ex- ample for that

⁵ 5 Like with interviewees and focus groups, each survey participant was briefed on all relevant aspects of the project to allow for informed consent. Each survey item gave the possibility to opt out of a specific question. 'Visiting' an educational institution does not necessarily suggest that a person has also obtained the respective degree(s) – often it represents a mere year or two.

⁶ 6 Parts of this section are adapted and updated from Rothenberg & Radley, 2014.

⁷ 7 3T traceability and certification happens across the Great Lakes region and in practice the scheme has so far been running in various other areas, including the provinces of North Kivu, Maniema, and Tanganyika for DRC, as well as Rwanda.

are a dozen of mines west of Nyabibwe around Numbi, whose production was laundered into the iTSCi supply chains prior to that area's validation in 2015.

Located some 75 km west of Bukavu, Nzibira is a mining area in the Kaniola grouping of Walungu Territory. While ASM is Nzibira's economic engine, there are many thriving small businesses including numerous restaurants and bars. Its key mining sites include Chaminyago, Muhinga⁸, Chembeke, Mahamba, and Zolazola. Most miners are young men from Bukavu and Walungu. In the past years, mining activity has reduced, with many miners either returning home or moving to other mines, particularly into gold which has been less impacted by recent formalisation initiatives. There are two main mining cooperatives active in and around Nzibira: the *Coopérative Minière des Exploitants Artisanaux*, COMIDEA, and the *Coopérative Minière et Agricole de Ngweshe*, COMIANGWE (de Haan & Geenen, 2016). Tensions have emerged between the two, since the former holds the government-validated mine sites while the latter, co-created by the customary chief of Ngweshe who has customary claims to the land, accuses COMIDEA of extorting miners and indirectly forcing traders and miners to join the cooperative.⁹ In the past years, the area has experienced a volatile security situation, mainly resulting from the activities of Raia Mutomboki – a decentralised local militia outfit – and their clashes with the national army, FARDC (Stearns et. al., 2013). By mid-2016, however, the situation in Nzibira and the surrounding mines appears to be more stable.

West of the Bukavu-Uvira road, Lemera is the seat of the Bafuliiru chiefdom in the moyens plateaux atop the Ruzizi plain. Although ASM continues to be the central activity, the number of miners (as well as their average income) has significantly dropped in both of Lemera's main mines – Mugerero and Kigunga – over the past five years. While there has not been a registered mining cooperative in Lemera, production used to be guided by a committee of elders linked to local customary power. More recently, the arrival of a joint venture between a Bukavu-based trading house and a concession holder has led to co-optation among both miners and inter- mediate traders (Vogel & Raeymaekers, 2016). While this joint venture faced allegations of using irregular security forces to 'guard' the mines, it also attempted at creating a pseudo-cooperative structure organised as a mere branch of the joint venture rather than an equal partner to it. Being the sole iTSCi-registered buyer for Lemera, the joint venture is also locally contested for de facto monopolising hitherto fluid local markets. Some of the resulting tensions also became embedded into ongoing customary succession struggles, with one side of the competing customary branches openly supporting the concession holder. It is this intertwined setup of state, private, and customary authorities that has indirectly linked ASM to continued conflict, often involving local armed groups associated to local power- brokers who connect chiefdom affairs to provincial and national politics (Verweijen, 2016).¹⁰

⁸ Even though Muhinga has been validated as a COMIDEA mining site, it is located outside of Walungu in the *groupement* of Luhago in Kabare Territory.

⁹ These tensions continue are exacerbated due COMIDEA's understanding that COMIANGWE, according to a ministerial decree, is supposed to only work in Artisanal Exploitation Zones (ZEA) although to date there is no ZEA in the area.

¹⁰ These groups have partly been demobilised in 2016, in particular the local defence forces led by Moliere Mutulanyi, but it remains unclear to which extent they continue to influence the area. Moreover, the smouldering customary succession struggle between Albert Mukogabwe and his brother Edmond Simba Muhogo bears dangers of future armed mobilisation.

4. THE ASPHYXIATION OF THE CANARY¹¹

Miners often carried a canary into the mine alongside them. The canary's more fragile respiratory system would cause it to collapse from noxious gases long before humans were affected, thus alerting the miners to danger. The canary's distress signalled that it was time to get out of the mine because the air was becoming too poisonous to breathe. (Guinier & Torres, 2002: 11)

In many mining areas, including those we focus on here, the number of people working in ASM (either as miners, auxiliary workers, or intermediary traders) is decreasing and socio-economic conditions worsening. This is due to many reasons, including in- security that continues to co-produce high migration among artisanal miners (Jackson, 2002), a Presidential ban that formally decreed the sector be shut down for a six-month period from late 2010 to early 2011 (Geenen, 2012); and the apparent end of the latest global commodity boom that negatively affected 3T prices (Cuvelier et al., 2014b) – just to name three of them.

These factors notwithstanding, our focus here is the dynamics linked to 3T formalisation efforts in sequence to 'conflict minerals' advocacy. We therefore focus on how current traceability and certification efforts change the socio-economic landscape and everyday experiences of mining communities. This approach builds upon the well-established idea that formalisation can positively or negatively affect miners' subsistence and livelihoods, depending upon its design and implementation. Hence, it can be a job machine or a socio-economic trap if it lacked a sufficient modicum of developmental complementarities. The relevance of formalisation was confirmed by two thirds of the respondents who were of the opinion that mineral traceability is generally something that has an impact on their socio-economic situation, out of which 43.2% said strongly so. Drawing from our data, including the number of miners, local prices, and a range of other socio-economic indicators, the subsequent observations, however, shed light on a rather tenuous situation on the ground for our present case.

Socio-economic hardship in South Kivu's ASM sector is reflected in the livelihoods of those working in the mines, and "a large share of these individuals are educated and/or skilled victims of purges in other sectors" (Hilson, 2016: 555). ASM is a mostly low-skill sector in which most tasks do not require higher education or specific technical training, yet 45% of survey respondents have enjoyed some secondary or university-level education. Our qualitative research suggests similar numbers. However, two thirds of survey respondents said their children would not or only intermittently go to school. This suggests that ASM in its current shape might be correlated to a reversal of intergenerational development gains in terms of education, although more research is needed to determine the exact nature of this relationship.¹²

¹¹ While the miner's canary is a metaphor of Western origin, we suggest it can be illustrative of certain dynamics in the case of eastern DRC's artisanal mining sector too. The image speaks well to the situation in which the Congolese ASM sector finds itself in the slipstream of transnational regulation. Hence, we speak rather figuratively in imagining the number and economic well-being of artisanal 3T miners as a canary that indicates to policy-makers (like the actual miner's canary indicated to miners) whether and to which extent their communities and livelihoods face existential threats hardly visible before they become irreversible.

¹² We base this claim on the fact that the current generation of children is less likely to go to school than their parents according to the survey.

Only 12 percent of survey respondents indicated they had regular access to health and medical services. In the absence of an efficient redistributive social system and insurance mechanisms, access to basic services in South Kivu is dependent on private capital and community solidarity. In our survey, 58.4% of respondents noted their revenue to have either strongly (29.6) or moderately (28.8) decreased while only 17.6% noted an increase since the onset of traceability. Possibly as a consequence of this decreased income since the introduction of traceability and certification noted by the majority of respondents, 40% of all respondents witnessed their access to health and education declining, while 22.4% reported stagnation, compared to the pre-traceability era. Only 12% experienced a positive development in these fields. Finally, at the time of the survey, 64.8% estimate their current living conditions as ‘very bad’ or ‘bad’, compared to 1.6% as ‘excellent’.

At the same time, 72% think that traceability lessened fraud in the mines and 60% think it reinforced state presence and authority in mining areas. While a good indication for the absence of a wider bias, these numbers carry some caveats: regarding the perception of fraud, our qualitative research suggests that while dynamics in the mines have changed, fraud around the mines did not substantially reduce.¹³ Moreover, fraud patterns that used to frame local mineral markets were replaced by a somewhat formalised ‘parafiscality’ in the mines and more sophisticated smuggling operations around the mines. The ambivalence of such parafiscal practice is embodied in the pairing of service delivery with potentially extortive and rent-seeking practices. This phenomenon is reflected in the survey results, where classic extra-legal taxation appears to be low, with only a few instances reported.

Nought point eight percent of respondents reported taxation by the territorial administrator and the *chef de poste d’encadrement administratif*, 2.4 percent reported taxation by *chefs de localité* or *groupement*, and 6.4 percent complained about taxation by security actors (police, army, and intelligence). This is contrasted by various formal taxes: 36 percent claim to be taxed by a cooperative, 50.4 percent by the customary chieftdom, 60.8 percent by the *Service d’Assistance et d’Encadrement du Small-Scale Mining* (SAESSCAM),¹⁴ and 61.6 percent by the local mining office.¹⁵ As a last category, ‘illegal’ taxation by ‘other actors’ was recorded by 36 percent of respondents (more than half of the latter were miners, and the rest local traders and mining-associated professionals). This includes 7.2 percent who report that the provincial anti-fraud service is collecting informal taxes, and 8 percent who note iTSCi staff to levy illegal taxes at the mine site. Often, landowners also receive taxes on production. SAESSCAM, iTSCi’s Congolese implementation partner, is engaged in both formal taxation (they collect fees for record cards and duties on production) and various parafiscal

¹³ This suggests respondents did not employ a ‘negative response set’. State authority is, against all odds, considered positive by most Congolese. Our qualitative work also confirms an increasing physical state presence across 3T mines in South Kivu. The seeming contradiction of survey and interview findings regarding fraud is best explained by the observation that open-air daylight fraud has diminished but other types of fraud have not, which could support that a quantitative study would note a decrease but a qualitative one not necessarily.

¹⁴ This is a government agency responsible for providing oversight and technical support to the DRC’s ASM sector.

¹⁵ The similarity between the latter two is explicable through the fact these authorities usually operate together in the field.

practices that revolve around negotiable contributions for placing iTSCi tags on the mineral bags prior to transport (usually between 0.5–1.5 USD per tag).¹⁶

To organise a more in-depth analysis of these results and enrich them with ethnographic data, we break our findings down to three intertwined topics in the context of emerging traceability: the re-configuration of mineral markets into ‘conflict-free’ but starkly monopolised supply chains; and subsequently the evolution of novel fiscal and parafiscal practices as well as the development of on-site mineral pricing.

4.1 Between a rock and a hard place – a traceability monopoly replacing a military monopoly?

While eastern DRC’s artisanal mines were infamous for their militarisation throughout the first decade of the 21st century, this paradigm is – as a consequence of transnational efforts against ‘conflict minerals’ – being gradually replaced by the notion of ‘responsible sourcing’ (Vogel & Raeymaekers, 2016). However, this notion operates on a comparably thin base: responsibility merely refers to the assumed ‘on-site’ absence of armed actors and human rights violations, as outlined by the OECD due diligence guidelines and various other pieces of an international legal and regulatory architecture.

Despite some efforts to couple the ‘cleansing’ of mines with comprehensive livelihood improvements, this has not been the primary concern of reform so far. For example, Nyabibwe’s Kalimbi tin site was validated as ‘conflict-free’ in June 2011 and began officially exporting ‘conflict-free’ tin through the iTSCi system in October 2012 as part of the Conflict Free Tin Initiative (CFTI). However, qualitative interviews conducted from December 2012 to July 2013 with 14 artisanal miners working at Kalimbi revealed that – since the site had received its ‘conflict-free’ validation – six of them had suffered from severe human rights violations (including forced labour), and all 14 from at least one form of human rights or labour violation.¹⁷ These included arbitrary arrest and imprisonment at the hands of the police, beatings by FARDC soldiers, mineral theft, illegal taxation, and safety incidents at the mine.

In addition, various sites around the later-on validated Numbi were under occasional influence by armed groups while their production implicitly fed into Kalimbi’s iTSCi supply chain. Meanwhile, CFTI declares on its website that its implementation at Kalimbi “represented an important milestone towards conflict-free mineral trading in the DRC, proving that due diligence and traceability is possible, even in the most challenging circumstance”.¹⁸ The fixation on consumer protection above local dynamics results from policy that was designed as a response to Western-led advocacy efforts. It gravitates around the question of how Congolese artisanal mineral production – which is embedded within global production networks – can be fed into a verifiable supply chain in order to provide western consumers with the leverage to buy products not associated with conflict activity (and exclude the opposite).

Temporal, financial, and practical constraints drove the concomitant efforts towards the establishment of closed pipeline supply chains, of which iTSCi’s bagging-and-tagging scheme is the main example. But while in theory this system allows for oversight and control of the different transmission points along the

¹⁶ In general, 37.6 percent of respondents report increases in taxation, while 20.8 report a decrease. 41.6 percent are unsure.

¹⁷ These 14 interviews have been carried out as in-depth case studies by one of the authors with a specific focus on the human rights and labour violations in artisanal mine sites.

¹⁸ See <http://solutions-network.org/site-cfti/> (accessed 16.08.2016).

upstream supply chain, it comes with the burden of local monopolies, or more precisely monopsonies,¹⁹ that – for the sake of excluding unclean production – trigger a de facto exclusion of myriad local producers and mines not associated with conflict. Monopsony, hence, is an accepted – if not even desired by key global tin producers – outcome of an adverse effect of a for-profit system initially meant as insurance to exclusively source and acquire ‘clean’ minerals. The following sub-section will expand on the impact monopsony can have on local price developments.

4.2 Mineral traceability and the collapse of local pricing

[Miners] are most likely to receive less money for the minerals they extract once traceability schemes are rolled out in the Kivus, as trading houses will have to start paying a fixed amount per ton of minerals. (Rothenberg & Radley 2014: 57)

While indeed 60% of survey respondents confirm the above prediction by 2016, there is not just one explanation to the price collapse in DRC’s local 3T markets. As mentioned, a decline in global demand (the London Metal Exchange, LME, being the lead indicator for tin prices) was felt all the way down the supply chain. Discussions about international pricing are – despite miners’ extensive knowledge of the supply chains they are part of – not always a very tangible issue to many of them (Smith, 2011). Partly because of temporality (local prices would often not rise or fall simultaneously to international ones), this often leads to conspiracy theories or resignation (Smith, 2015). Nonetheless, research into industry websites clearly shows the recent price carousel: while tin peaked at over 30,000 USD/ton in early 2011, prices plummeted to less than half of that in late 2015.²⁰ Industry insiders too, have stressed these patterns.

Still, withholding Kivu-bound dynamics would be spurious. The traceability scheme levies important fees from the so-called *comptoirs* (DRC-based trading houses that buy, refine, and re-sell minerals to international markets). Depending on the amount, quality, and type of minerals, as well as the contract under which *comptoirs* join the scheme – some pay monthly fees, others per exported ton – iTSCi’s fees are variable. Testimonies from subscribers vary between 180 and 480 USD/ ton, resulting in “levies that exceed the amount of taxes that we pay to the government”²¹. While it is difficult to calculate the de facto depreciation of cassiterite at local levels, the range can be estimated between 0.2 and 0.5 USD/kg according to several *comptoirs*, or around 5–20% of a local miner’s selling price.²² These tax-like levy fees are part of the explanation why in some non-validated sites the local 3T prices are higher than at iTSCi sites (up to 1–1.5 USD/kg higher for cassiterite and up to 10–12 USD/kg higher for coltan), thus encouraging smuggling, including to neighbouring Rwanda where iTSCi levies are lower.²³

A further part of the explanation is rooted in the concomitant monopsony structure established through iTSCi. While mostly one big international smelting company buys iTSCi-tagged cassiterite from the DRC, the local part of the supply chain has been similarly articulated since only iTSCi-registered *comptoirs* can buy. This leads to situations where there is a single buyer at the local level, Lemera being but one example.

¹⁹ Monopoly means, only one producer sells a product, while monopsony is the opposite: only one consumer buys a product.

²⁰ See <http://www.lme.com/en-gb/metals/non-ferrous/tin> (accessed 01.08.2016).

²¹ Interview #85 (16.08.14).

²² Interviews #85 (16.08.14), #162 (10.09.2015), #186 (24.09.2015).

²³ Interview #9 (28.05.14). In addition, a range of taxes are reported to be lower in Rwanda than in the DRC.

There, a combination of global price drops, monopolised supply chains, iTSCi levies, and local tensions leading to insecurity have strongly affected the socio-economic environment: Lamera's local market that used to be the grouping's economic pivot has shrunk by around two-thirds since iTSCi's inception.

In sum, the arrival of traceability has coincided with several endogenous and exogenous developments that continue to have an overall negative impact on local mineral prices. While, on a more positive note, certain mining areas did experience a short-term price stabilisation and even slight increases after the advent of iTSCi, these instances remain limited and could not reverse the trend of miners migrating away from 3T areas towards gold and gemstones while mineral contraband is on a new rise since 2014. This speaks intimately to the logic of the miner's canary – before a total collapse warning signs point at the possibly impending 'failure of vital organs' such as the local price mechanisms and market access in this case.

4.1 Formalisation and new forms of taxation: *“le SAESSCAM est en difficulté”*²⁴

As shown for other African ASM contexts, moves towards “formalization have tended to centre on monitoring, regulating and tracking mining activities, in the hope of channelling more revenue to a central government authority” (Maconachie & Hilson, 2011: 301). This does not always happen in a deliberate strategy by respective governments – the reality is often messier. While central administration has indeed a keen interest in maximising revenues, this may not necessarily lead to a coordinated top-down approach. On the contrary, the goal of revenue maximisation can be much more decentralised, and in fact serve to satisfy vast patronage networks and defuse bottom-up pressures of local administration in a proverbial 'fend-for-yourself' fashion (Mueller-Koné, 2015). In eastern DRC, the role of SAESSCAM is particularly ambiguous:

The example of SAESSCAM is reflective of a broader structural challenge experienced by all the agencies and technical services operating within the Ministry of Mines (and the Congolese government in the eastern DRC at large). Under-resourced, they find themselves unable to effectively fulfil their mandates, which require significant logistical capacity to traverse the vast distances between and to mine sites and significant technical capacity to effectively carry out their work once there. Underpaid or unpaid, the agents who are in the field find themselves needing to resort to alternative strategies to survive, often including extortion or theft. (Rothenberg & Radley, 2014: 21)

ASM formalisation in the guise of traceability has changed little to SAESSCAM's situation. A senior official of the organisation lamented “iTSCi uses us as their delivery boys”. A colleague of his confirms, “iTSCi is creating a lot of extra work for our staff.” In part due to lack of a concomitant burden sharing when it comes to the implementation on the ground, SAESSCAM agents on some occasions “sell tags to miners for money”.²⁵ Various interviewees also castigated iTSCi's practice of handing out their production logbooks to SAESSCAM agents and showing up in the evenings to recover the filled files without having been present during the process of registering mineral bags.

This raises important questions regarding the way ASM formalisation is implemented in South Kivu. Formalisation is indeed considered as a technique by which governments or state actors assert control over

²⁴ 'SAESSCAM is in jeopardy.' Interview #9 (28.05.14).

²⁵ Interviews #130 (13.08.2015) and #177 (18.09.15).

an economy that used to be, at least partly, beyond their grasp (Geenen, 2012).²⁶ Nonetheless, “few of the regulatory frameworks now in place for ASM in the region are in tune with the realities on the ground. Misguided and misinformed policy, therefore, has, in large part, ‘created’ the burgeoning informal ASM economy” (Hilson, 2016: 552). While ASM practice in the DRC antedates any Congolese ASM policy, it can be argued that policy in a wider sense has failed to provide formal sector opportunities that could have absorbed parts of the ASM labour force. In its joint venture with iTSCi, the Congolese mining administration increases oversight and taxation capacity. However, reform has not been preceded by an analysis of local production and transaction patterns, which is one of the reasons why little of the regained control transforms into formalised state governance techniques.

Instead, there is an emergence of novel forms of parafiscal taxation that develop into an example of what has been coined elsewhere as ‘practical norms’ (Olivier de Sardan, 2008). This resonates with the logic of ‘re-inventing institutions’, as Cleaver has framed it in her work on bricolage (Cleaver, 2002). The role of cooperatives further illustrates these logics. While they need to register with the state, and thus become subject to various one-time and periodical fees, mining cooperatives have become a key player on the field of taxation: over a third of the survey respondents indicated contributions payable to a cooperative. The nature of these cooperatives, however, differs from case to case: while a few are genuine cooperatives in the very sense of the term, others range from business associations regrouping traders instead of miners to kinship organisations around customary leaders, or syndicalist appendices of larger companies that co-opt miners, and the occasional non-governmental organisation dealing with anything generating funding.

5. REFORMS VERSUS DEVELOPMENT?

We at SAESSCAM realise that we, and the state behind us, lack capacity to fulfil our mission, and this is not only about money. (Interview #177, 18.09.15)

Modernisation does not equal development: a hackneyed phrase but still illustrative for eastern DRC’s 3T markets. Transnational initiatives to reform the sector have started off from the uncomfortable position of having a narrow policy goal (‘clean up mineral supply chains’), whose ramifications reach deep into a complex nexus linking economic subsistence, market regulation and political power. This has led to various shortcomings, most of them based on one or a combination of the following five factors.

First, some generic challenges were overlooked due to lack of interest or insufficient means. This is most visible for the case of property where overlapping and contested rights to land and concessions prevail. For instance, in her critique of formalisation in South Kivu’s gold sector, Geenen paraphrases that “legal titles are a key and necessary first step to take, but it would not be sufficient. Other aspects such as access to finance, technical expertise, education and training also need to be addressed” (Geenen, 2012: 324). Our research on 3T has found that in many cases, even the issuing of clear titles for land and mining concessions remains an aspect largely unaddressed by current (transnational) reforms.

²⁶ However, while this reading applies to our study, it remains questionable in hindsight to what extent the 2010/2011 mining ban was an actual attempt by the DRC central government at formalising the ASM sector, or rather a measure to simply re-articulate the complex spheres of influence and control around certain key mine sites, first and foremost Bisie in North Kivu.

Second, top-down formalisation remains in some shape of form seen as the holy grail to ASM governance. This has both concealed the potential of local solutions and fostered window-dressing such as establishing of mining cooperatives, many of whom provide exemplary cases for the contradictory logics of a formalisation co-led by transnational reform (de Haan and Geenen, 2016; Babwine and Ruvunangiza, 2016). In our three main field sites, the enactment of mining cooperatives has led to tensions. While in Nyabibwe, two competing cooperatives engaged in sharp rivalry, in Nzibira, two cooperatives contested one another's legitimacy through attempts of extortion, customary influence and pressure on local traders. In Lemera, a pseudo-cooperative founded by businessmen provoked anger for taking the miners economically hostage.

Third, the elements of reform, such as traceability, have been imposed upon locally existing systems and regulations. While many of them were (and still are) 'informal', by far not all of them are 'conflict-prone' or 'illicit'. In contrary, a majority of the hundreds of mining sites in South Kivu do not feature militarisation or massive human rights violations. Nonetheless, they remain excluded from legal market access due to the traceability scheme's slow expansion: before a mining site can be declared 'green' and becomes eligible to certification, a cumbersome multi-stakeholder validation process is necessary. This process, however, lacks the instruments to monitor the situation over time. In addition, local solidarity networks, such as through intermediate traders that act as brokers of consumer goods and credit, are increasingly under pressure.

Fourth, key elements of the reform process were hastily privatised. The way in which iTSCi as an industry body controls – in the larger field of governmental and non-governmental regulation frameworks – traceability of 3T in eastern DRC is a key example. However, even though 'corporate social responsibility' (CSR) is of growing relevance both in the DRC and globally, private sector interest in local and institutional development remains secondary at best (Radley, 2016). While company-specific CSR measures are implemented in most industrial mining areas across the DRC, the overarching traceability framework does not foresee major socio-economic measures. An alternative government-led process is the so-called 'basket fund'. In collecting taxes from different market participants (miners, traders, transporters, and comptoirs) this fund aims at centralising the means for larger development projects, such as health and infrastructure. While there is evidence of a few success stories, civil society organisations have repeatedly cast a critical lens as to how these funds are used, recently deploring that "the Provincial Minister wants to channel these funds to provide for his private needs".²⁷

Finally, local development has been conceived of as a 'logical corollary' of a mostly technical solution to a multi-scalar problem. In an overtly liberal-interventionist fashion, reform of the ASM sector follows the logic that implementing streamlined and articulated supply chains will integrate local producers into globalised capitalist markets and subsequently lead to a gradual wealth increase. Unfortunately, the basic conditions and complementarities to such a scenario do not exist in South Kivu, nor elsewhere in eastern DRC: independently of reform, violent conflict continues unabated despite the fight against 'conflict minerals' (Stearns and Vogel 2015). Politico-economic governance patterns in the DRC – while often

²⁷ '[...] le Ministre provincial voudrait affecter ces fonds pour pourvoir à ses besoins privés.' Quoted from a declaration of the South Kivu Civil Society Thematic Group on Mining and Natural Resources, on file with the authors.

complementary to each other – are not necessarily shaped to respond to the logics of capital accumulation and/or a social contract-based economic system. Transnational reform to ‘improve’ mineral governance in eastern DRC should therefore develop an interest to embed these complementarities instead of suffocating them.

6. HAKUNA MAENDELEO:²⁸ FORMALISATION’S LONG-TERM LEGITIMACY AT RISK

In the context of economic hardship in South Kivu’s artisanal 3T mines, partly based on old patterns and partly on the incompatibility of transnational reform and local development, the results of our ethnographic work mixed with quantitative insights present a worrying picture. Noting the prevalence of other factors that undermine ASM livelihoods, including the 2010–2011 Presidential ban on artisanal mining, the collapse of international 3T prices and eastern DRC’s continuing patterns of insecurity, in this article we exclusively focused on the role of formalisation in the gradual disarticulation of 3T markets at the local level, driving miners into either unemployment, gold mining, other precarious occupations, or – given many miners are demobilised combatants – back into armed group recruitment in certain cases.²⁹

Our research suggests that the recent evolution of South Kivu’s erstwhile flourishing 3T sector suggests a variety of socio-economic indicators stress the sector’s recent downturn, with formalisation efforts in the guise of traceability being one important factor. Both the miners³⁰ decreasing number as well as their unvarnished self-judgement offers evidence of rising distress. However, this need not result in a blanket anti-formalisation argument. The very reason how and why certain formalisation approaches harm local producers and their communities are diverse and specific to the context. In the case of South Kivu’s artisanal 3T sector, a combination of factors linked to formalisation and the concomitant push for traceability and certification aggravates an already tenuous socio-economic position.

While some factors are directly linked to transnational intervention in the slipstream of ‘conflict minerals’ policy, others are rooted in the way the Congolese state deals with the changing conditions. The latter in particular leads to new ways of creative resistance, in the very sense that “people “people involved in criminalized forms of work and networks of exchange sometimes come to see the act of defying state authority as an ethical practice in and of itself” (Panella & Thomas, 2015: 6, see also Raeymaekers, 2014; Roitman, 2005). This is illustrated by local commentary on iTSCi, often described with detention metaphors: while a veteran trader argued “these tags shut down our business like they lock up the mineral bags”³¹, another one stated, “the tags are just like a prison”.³² The criminalisation of extra-iTSCi supply

²⁸ ‘There is no development’. Sentences used by dozens of survey respondents independent of each other.

²⁹ Research conducted by one of the authors in Shabunda Territory of South Kivu Province in 2013 found around one dozen combatants in a fifty-strong Raia Mutomboki battalion who claimed to have joined the armed group after they lost their employment – which has been either directly or indirectly dependent on artisanal mining – following the Presidential mining ban and what they referred to as ‘Obama’s Law’ (in reference to Dodd-Frank 1502).

³⁰ Here we speak of miners in generic terms, including associated occupations such as traders, washers, diggers, porters, etc.

³¹ ‘Ma cracas inafunga kazi kama inafunga ma colis.’ Interview #114 (02.02.15).

³² ‘Ma etiquette iko sawa prison.’ Interview #117 (03.02.15).

chains and the concomitant rise in fraud hints at possible negative impacts of formalisation's long-term legitimacy.

In the meantime, the persistence of non-state armed actors – previously accused as main profiteers of fraudulent mineral trade – is manifest in the observation that by late 2015 over 70 identifiable groups have been operating in South and North Kivu alone (Stearns and Vogel, 2015). This shows that armed mobilisation and violent conflict have root causes other than natural resources (Verweijen and Iguma, 2015). Notwithstanding the modicum of positive impacts considered above, the double shortcoming of formalisation via currently existing traceability and certification efforts is that it neither improves the living conditions of miners and their dependants nor does it necessarily tackle the problem of violent conflict and concomitant human rights violations, which advocacy groups had initially targeted.

In all that, eastern DRC's artisanal miners are indeed slowly turning into their very own miner's canary, a canary that national and inter-national policy-makers and advocates may want to watch closely.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.exis.2017.09.003>.

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