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In the Face of Reform: What Future for ASM in the Eastern DRC?

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Abstract

This article aims to assess, on the basis of empirical evidence from South Kivu, what the future may hold for artisanal mining in the eastern Democratic Republic of Congo (DRC). The eastern Congolese mining sector is undergoing a period of profound change. Industrial exploitation, while still nascent in the Kivu provinces, appears poised to expand with a number of transnational mining companies currently exploring vast concessions. At the same time, there are a range of new initiatives to regulate and formalise the artisanal mining sector, but early evidence shows that they have failed to have a positive impact. We identify a number of factors hindering the effective implementation of these initiatives, namely state capacity and political will, the complex dynamics and power relations in the current system of artisanal mining and trade, the importance of these activities for livelihoods and the lack of alternative livelihoods. We also provide suggestions for future interventions, including initiatives to promote a viable artisanal mining sector which contributes to broader local development.

Keywords: artisanal mining, formalisation, viability, local development

1. The state of ASM in the eastern Democratic Republic of Congo (DRC)

The DRC's enormous mineral wealth has long been heralded as a 'geological scandal', and includes important deposits of copper, cobalt, tin, tantalum, gold and diamonds [1]. Eager to capitalise on this wealth, the Belgian colonial administration rapidly established and developed large-scale mining (LSM) during the first half of the twentieth century. Yet the productive capacity of LSM was too slow and eventually decline following independence and the nationalisation of the colonial mining companies under Mobutu. A combination of economic mismanagement, deteriorating infrastructure and external shocks (including the two Shaba wars, the closure of export routes to Angola, and price fluctuations on the world market) led to a rapid drop in industrial production from the 1970s onwards, falling close to zero by the mid-1990s.

During the same period, artisanal and small-scale mining (ASM) activity soared following its legalisation in 1983 when Mobutu liberalised the sector to allow Congolese citizens to directly exploit and trade in minerals as a way to 'fend for themselves' during a time of economic hardship. Then, during the two Congo wars (1996-2003), armed groups took control of a number of mining areas as a means to raise revenue to finance their operations (a legacy that has lasted to this day). They also negotiated contracts with mining companies – as did the Kabila government - selling

off vast concessions at well below the market price (many of which have since been revoked following governmental review).

In more recent years, the Congolese government has sought to reverse the historical decline of LSM by attracting foreign investments to develop new industrial mining projects. The IMF and the World Bank have provided significant financial and technical support in pursuit of this goal. Furthermore, the current Kabila government is viewed by many as keen to replace ASM with LSM projects, due to the ease with which revenues can be controlled and extracted from industrial mining companies in comparison to millions of independent artisanal miners [2, 3]. In Katanga, industrial production of copper and cobalt is again at unprecedented levels [4, 5]. Yet firmly establishing industrial mining in the Kivu provinces of the eastern DRC will be a long process given the security and logistical challenges, and one whose trajectory is far from clear. In 2011, 42 companies held research permits in South Kivu to engage in exploration, yet currently there is only one industrial mining operation (in production since November 2011), the Twangiza gold mine, owned by the Canada-based multinational Banro [2, 6]. This one gold mine aside, all mineral production in the Kivu provinces occurs through ASM.

Official gold exports from South Kivu peaked at 1,911 kilograms in 2002, plummeting to just 23 kilograms in 2011. Yet since almost all gold production in South Kivu is mined, traded and exported without being officially registered [7], the official figures only tell part of the story. A World Bank study showed annual gold production in Orientale, Ituri, North-Kivu and South Kivu of 12,000 kilograms in 2008 [8], the same year that official gold exports from South Kivu were recorded as just 65 kilograms. Before the effects of the de facto embargo in the region took hold, which we will discuss later, official figures for South Kivu from 2008 recorded cassiterite exports at 6,004 tonnes and coltan exports at 440 tonnes. The most recent audit report from the Extractive Industries Transparency Initiative for the year 2010 highlighted that in 2008 and 2009 the mineral trade from the Kivu provinces contributed \$17,252,208 to the state budget [9]. Given the vast amount of minerals smuggled out of the Kivu provinces with no contribution to the state budget, the real value of minerals produced in the region is, while difficult to quantify, significantly higher.

Beyond its productive capacity and economic value, ASM is one of the most important livelihoods in the DRC. Drawing on available data, the World Bank has estimated the number of people in the DRC directly or indirectly dependent on ASM for their livelihood at between 8 and 10 million, or 14 to 16 percent of the total population [10]. Available estimates for the number of artisanal miners in the Kivu provinces, taken from 2007 and 2010 respectively, put the figure between 200,000 and 350,000 [11, 12]. 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. Factoring in secondary economies and supply chains, the number of people directly and indirectly dependent on ASM grows greater still. Concerns for mining communities in the area have been raised on a regular basis in relation to human rights, child labour, environmental pollution, health issues and working conditions [12], reflecting research findings on the living and working conditions for mining communities across Africa [13, 14].

2. The future of ASM in the eastern DRC: regulation and formalisation

Three principal legal documents govern the Congolese mining sector today: the Mining Code (2002), the Mining Regulations (2003) and the Investment Code (2002). ASM is legalised and therefore to a certain extent protected by these documents. Of perhaps most significance to the practice of ASM, the Mining Code established the requirement for artisanal miners to work in

officially recognised Artisanal Exploitation Zones (ZEAs). Within these zones, artisanal miners must apply for a ‘carte d’exploitant artisanal’, an official authorisation to mine, which must be renewed each year. They also need to comply with the regulations on security, hygiene, water use and environmental protection specified in the Mining Regulations¹.

The Second Congo War (1998-2003), which ended at around the same time as the introduction of the above legislation, proved equally influential in shaping the direction and course of ASM in the eastern DRC. During the war, forces from Rwanda and Uganda along with numerous Congolese militia groups established control of the production and trade in minerals throughout the Kivu provinces. The resultant relationship between armed groups’ control of mineral exploitation and the continuation of conflict achieved global attention reaching as high as the United Nations Security Council [15]. Numerous critiques have been made of the assumed links between armed groups and mining, based on the fact that “it presumed a [...] very partial analysis of the causes and dynamics of conflict in the DRC: namely that because armed actors use money deriving from natural resources, they are fighting about natural resources” [16]. In reality, the root causes of the conflict may be found in long-standing grievances, political, economic and social marginalization and state failure; and only a minority of Congolese conflicts are over natural resources². Moreover, minerals are not the only source of financing for armed groups, but just “one dimension of a wide repertoire of military economic practices” [18]. Armed groups also rely on taxation of citizens, revenues collected at roadblocks or trade in cigarettes and drugs, charcoal, timber and bananas [19, 20]. So cutting them off from this source of revenues is unlikely to stop the violence. Nevertheless, this focus on ‘conflict minerals’ gave birth to numerous initiatives aimed at preventing armed groups from generating mineral revenue. Most of these initiatives are based on the concepts of due diligence, certification, and traceability [21, 22, 23, 24]³.

Due diligence requires companies to develop and implement internal systems and procedures to determine the precise origin of minerals being purchased from known conflict areas. The initiative has gained momentum over recent years, most significantly from section 1502 of the Dodd-Frank Act, U.S. legislation passed in July 2010 demanding due diligence from American companies sourcing minerals from the DRC [25, 19]. In February 2012, the Congolese government adopted OECD due diligence guidelines into law. Certification and traceability respond to the demands of due diligence by making it possible for final buyers on the international market to determine whether minerals have been sourced from conflict or non-conflict areas. Certification traces the supply-chain while encompassing a consideration of safety, health and environmental factors, and traceability ‘bags and tags’ minerals sourced from approved ‘non-conflict’ mining areas on site before transporting them to the trade counters of Bukavu and Goma⁴. In 2009 the Congolese government published a ‘handbook for traceability’, detailing all the steps to be taken, all actors and services involved in tracing the origins of minerals, certifying and taxing them, and even the fixed ‘routes’ minerals should take from the mine to the export office, passing through ‘centres de négoce’ or centralised trading points⁵. Still in accordance with the handbook, a number of mining

¹ Mining Code, T. 4, Ch. 1, Art. 111 and 112.

² Autesserre [17] notes that only 8 per cent of Congolese conflicts are estimated to be over natural resources.

³ The referenced reports provide good and critical overviews of national and international initiatives.

⁴ Such traceability and certification systems have been proposed and piloted by the industry itself. Tin smelters represented by the International Tin Research Institute (ITRI) have proposed a supply chain initiative called iTSCi or ITRI Tin Supply Chain initiative. The German government supported an initiative through the Federal Bureau of Geo-Sciences and Natural Resources BGR [26]. Other projects were launched by a private company Met Trak [27] and by the ICGLR [28].

⁵ Ministère des Mines, Ministère des Finances (2009) Manuel des procédures de traçabilité des produits miniers, de l’extraction à l’exportation.

sites have been assessed as being ‘green’, ‘yellow’ or ‘red’⁶, depending on the level of conflict and the presence of practices like child labour or human rights abuses.

But apart from a few small steps that have been taken, most procedures foreseen in the handbook or in the Mining Code are not yet operational. The impact of the technical certification and traceability initiatives is also very limited. Early evidence shows that they have failed to make significant progress in achieving their goals and have even negatively impacted ASM, as they have provoked a de facto ban on minerals from the Kivu provinces [8, 24, 29, 30, 31]. So what does the future hold for ASM in the eastern DRC, given the range of new initiatives underway? In the remainder of this article we will analyse, on the basis of empirical evidence from South Kivu, the current progress and impact of regulation and formalisation initiatives. We will try to identify the factors that hinder their effective implementation, and in the final section we will make proposals for future interventions.

The research is based mainly on qualitative fieldwork in different mines in South Kivu and Bukavu during the period 2008-2012. The main argument of the article is that the failure of these initiatives can be pinned to their detachment from the complex realities and power dynamics of the Congolese mining sector. They offer simplified technical solutions to complex socio-political phenomena. They also vastly underestimate the resources required to effectively govern hundreds of isolated mining sites spread across difficult terrain in one of the largest countries in the world.

3. Regulation and formalisation: some empirical evidence from South Kivu

3.1. Traceability in Nyabibwe

The cassiterite site of Kalimbi-Koweit near Nyabibwe has been qualified as a ‘green’ site to supply the ‘centre de négoce’ at Nyamukubi. Here, the International Tin Research Institute (ITRI) launched its supply chain initiative as a pilot project in June 2010⁷. The aim was to tag each load of minerals and, in partnership with Service d'Assistance et d'Encadrement du Small Scale and Artisanal Mining (Saesscam) and the Mining Authority, prepare all the official documents to enable the minerals to be legally purchased by the final buyer on the international market. But the project has faced several challenges. First, it has been conceived as a purely technical intervention that, as Cuvelier [32] puts it, “can be carried out in an apolitical manner”. The same author demonstrated the complex local power struggles at Nyabibwe that contradict such an approach, between the rival cooperatives Coombecka (“Coopérative du Bien-être de Kalehe”) and Comika (“Coopérative Minière de Kalimbi”), and between the local miners and the company Shamika, which had acquired research permits.

Another challenge was the imposition of the Presidential ban on all artisanal mining activities in the provinces of North Kivu, South Kivu, and Maniema between the 9th of September 2010 and the 1st of March 2011. The ban was justified as a way to retake control over the sector, decrease militarisation and proceed with formalisation, yet the effects seem to have been the opposite [29]. As a result of the ban, tens of thousands of people were thrown into unemployment, parents were unable to pay school fees, and the agricultural sector suffered adverse and prolonged knock-on effects [3]. Furthermore, military actors and police actually acquired greater control over mining activities. Before the ban, artisanal activities, although technically illegal (because they took place

⁶ Arrêté ministériel n° 0189/CAB.MIN/2012 du 23 mars 2012 portant qualification et validation des sites miniers des territoires de Kabare, Mwenga et Walungu

⁷ ITRI, DRC Ministry of Mines reconfirms official support for iTSCi mineral traceability project, 11 June 2010. See also [16].

outside of ZEAs), were carried out in public. This changed however during the ban, as miners started to work clandestinely and at night. Security agents took advantage of this situation to force the miners to work under their ‘control’ in exchange for a share of the production [29]⁸.

Following the lifting of this ban, attention focused on the U.S. due diligence legislation, the Dodd-Frank Act, which was due to become operational on the 1st of April 2011. Although the implementation date was delayed⁹, the official export offices (‘comptoirs’) in South Kivu barely registered any activity in 2011 and 2012. The only two – Chinese – comptoirs for cassiterite and coltan that reopened after the lifting of the mining ban were forced by the government to close down in May 2012. The threat of Dodd-Frank thus created, according to Seay [19], “a de facto ban on Congolese mineral exports, put anywhere from tens of thousands up to two million Congolese miners out of work in the eastern Congo, and, despite ending most of the trade in Congolese conflict minerals, [has] done little to improve the security situation or the daily lives of most Congolese”. Seay’s assessment has been supported by a number of more recent reports confirming this embargo effect and its negative socio-economic consequences for local communities [8, 29, 30, 31]. In Nyabibwe, although being recognised as a ‘clean’ (‘green’) site, government agents continue to levy ‘illegal’ taxes and cases of fraud appear to be widespread, while official production came to a standstill for more than two years because of the de facto ban¹⁰, only recently beginning once more in the last few months¹¹.

3.2. Cooperatives and ZEAs in Walungu

As we have noted earlier, the Mining Code requires artisanal miners to come together in so-called ‘groupements’ or cooperatives. These cooperatives may apply for research and exploitation permits within artisanal exploitation zones, and would thus embody the desired transition to small-scale mining activities. During the 2010–2011 ban on artisanal mining activities the Ministry of Mines in South Kivu pushed cooperatives to submit their files to the Provincial Authority of Mines. This in turn led to some individuals, often in collusion with powerful local elites, setting up a ‘cooperative’ and trying to get it recognised in order to serve private interests rather than advance those of the miners. Moreover, administrative procedures proved to be complicated, slow and above all costly. Cooperatives are first required to introduce their file to the Provincial Ministry of Mines, which entails administrative fees, as well as fees for legalising the statutes¹² at the tribunal and paying for members’ cards. After receiving ‘favourable opinion’ from the Provincial Minister, they must then bring the file to Kinshasa, more than 1,500 kilometres away, for their cooperative to be officially recognised.

In South Kivu the leader of an umbrella organisation for cooperatives, Gécomiski (‘Générale des Coopératives Minières du Sud-Kivu’¹³), told us he usually takes on several files at a time and travels to Kinshasa, where he again has to go through an administrative carrousel (cooperative leader int. Bukavu 26/05/2012). At the national level cooperatives must also pay contributions as decreed in 2011 by the Minister: \$2,500 annual duties, \$5,000 deposit, and \$500 to introduce the

⁸ In [29] and [33] we discuss the perverse effects of the mining ban, based on first hand observations and interviews in Kamituga, Lugushwa and Twangiza.

⁹ The final regulations of the Security and Exchange Commission were approved in August 2012. Companies had to comply with the final rule for 1 January 2013, with the first reports due 31 May 2014.

¹⁰ Personal communication with mining engineer, 24/12/2012. See also [34].

¹¹ See [35] and <http://solutions-network.org/site-cfti/results/> for recent production data.

¹² The model statute (‘Statuts-type pour une coopérative minière’) is inspired by a colonial example (‘Décret du 24 mars 1956 relatif aux coopératives’) and is thus criticized for not being adapted to current realities (cooperative leader int. Bukavu 26/05/2012).

¹³ An umbrella organization of 33 cooperatives in South Kivu.

file. On the 3rd of June 2011, 46 cooperatives representing almost 60,000 members had submitted their files, and only 16 of these had received a favourable opinion from the Provincial Minister of Mines. More recent figures from 2012 indicate that 62 cooperatives had submitted a file¹⁴. About seven of these obtained their official recognition from Kinshasa by mid-2012 (cooperative leader int. Bukavu 26/05/2012). As we have indicated, this process may have been rash. Although some cooperatives have existed for a long time and serve miners' interests, other cooperatives have been created for purely private reasons. They have not grown organically, but as a top-down creation resulting from central government policy. There also seems to be some confusion over what a cooperative should do. As most lack the financial and technical capacities to become 'production units' and engage in semi-industrial mining as foreseen in the Code, cooperatives now mainly concentrate on educating their members on the law, child labour and health issues (idem), and in this sense they act more like local NGOs than cooperatives. In section 4.2 we will further discuss the potential of cooperatives to advance miners' interests, but we first offer a concrete example from Walungu territory.

The 'Coopérative des artisans miniers au Kivu' (Copamik) is yet to receive favourable opinion from the Provincial Minister. Copamik was created in 2007 and was active in Mukungwe, a gold mine situated about 65 kilometres from Bukavu in Walungu territory (cooperative leader int. Bukavu 14/05/2012). Mukungwe, where 1,200 to 3,000 miners work in underground and alluvial mines, is a highly contested site. Since the discovery of gold in the 1970s there has been an ongoing dispute between the customary chief ('chef de groupement') and the customary land owner over who may exploit the land and reap the benefits of the gold mining. At times this dispute has been fought by legal means, but it has also turned violent, for example during the Second Congo War, and more recently in 2011 and 2013, when the fighting parties called upon different factions of the Congolese national army to take control of the mine. Recently the company Banro (see above) claimed that it holds research permits for Mukungwe, a claim that was violently contested by the site's artisanal miners but that has been confirmed by the Ministry of Mining (personal communication 26/09/2013). The leaders of Copamik were supporting a number of mining pits in Mukungwe, where small machines and water pumps were being installed thanks to a partnership with an investor from Tanzania (cooperative leader int. Bukavu 14/05/2012). But they came into conflict with another cooperative set up by the customary land owner. In brief, the legal uncertainties, unstable security situation and local competition between different chiefs and their cooperatives are making work difficult in Mukungwe.

One of the basic problems is the fact that very few zones where cooperatives can legally work. In the territory of Walungu for example, no 'artisanal exploitation zones' have been created¹⁵, and in the entire province of South Kivu, there are only seven. They have a very limited total surface area (219 km², compared to Banro's exploitation permits covering more than 2,790 km², not to mention the far greater surface area covered by its research permits). Secondly, no geological studies have been undertaken to determine mineral reserves for these zones, let alone to calculate whether they would be profitable to artisanal mining. Thirdly, some zones are very remote and hard to access due to poor infrastructure and insecurity.

3.3. Displacement and alternative livelihoods in Twangiza

We have already observed that through its policy approach the Congolese government prioritises large-scale mining corporations in order to attract foreign investment and gain better control over

¹⁴ Reports Provincial Authority of Mines South Kivu.

¹⁵ Provincial Authority of Mines South Kivu, Annual Reports, Ministerial Decrees.

mining rents. Vast concessions have been granted to foreign companies, some of which for exploration work, but many of which are inactive (the so-called 'dormant titles'). The only company that is currently in the production phase in South Kivu is Banro in Twangiza. In 1997, Banro acquired the mining titles to four gold concessions (Twangiza, Lugushwa, Kamituga and Namoya), but because of the war and ongoing disputes over the titles, exploration only started in Twangiza in 2005¹⁶. The company carried out sample drillings and started to build roads and a factory on Mbwega hill in Luhwindja chiefdom. Until that time, an estimated 6,000 artisanal miners had been working in Mbwega and the surrounding sites (principally Kaduma and Lukunguri) [36], but they were, over time, chased away by Banro. In the area surrounding the mine, households were also negatively affected by the drillings and construction work which caused landslides, pollution and the destruction of their fields. Banro was thus faced with significant popular resistance. In 2009 the company acknowledged a negotiated approach was needed, and set up a 'community forum' with the mission to discuss compensation, resettlement, reintegration and employment issues, on which an agreement was reached in 2010¹⁷. For the artisanal miners, the latter provided a 'reintegration programme', albeit for a limited number of people. 875 former artisanal miners were to be employed by Banro as day labourers in various jobs associated with the construction of the mine. A further 400 miners, who had been identified in a survey carried out in the artisanal sites, would participate in different professional training programmes carried out by local NGOs under the supervision of Banro and the Banro Foundation, with financial support from the company.

Yet in mid-2011 the situation changed. The Presidential mining ban was lifted on the 1st of March. At the same time, the abovementioned reintegration programmes had come to an end, and not all former miners had been able to find new employment. The 875 day labourers were being progressively laid off. Banro had used these unskilled workers in the construction of infrastructure, but they had become redundant now that the production phase (November 2011) was approaching. These three factors, combined with general feelings of frustration and marginalisation, incited hundreds of miners to reoccupy the sites that Banro had previously closed down (Mwana, Kaduma and Lukunguri) in April 2011. In Mwana river hundreds of miners – estimates range from 470 to 900 – resumed gold panning (chief miners int. 26/10/2011; focus group 26/10/2011). In Kaduma and Lukunguri, more than 50 pits were reopened by miners who had successfully forced the entrance to the sites open again (miners Kaduma focus group, 07/07/2012). The problems were clear: these artisanal miners had been chased away from their area of work, but they had no legal place to work in, nor any real alternative livelihood options. Some invested thousands of US dollars in underground pits, and had outstanding loans with traders who supported their activities [37]. These relationships came under serious pressure too.

In June 2011, the provincial governor came to the reoccupied sites in an attempt to calm the situation. He instructed Banro to allow miners to work until the government came up with a solution. Concretely, this meant that Banro should find an area within their concession for the artisanal miners to work. In 2012 the Mining Registry allegedly negotiated with Banro to cede parts of the concession to artisanal miners (ministry of mines int. 28/09/2012), but Banro is reluctant

¹⁶ For more details on Banro's history in the DRC and on the Twangiza case, see [2 and 6]. In the former article we demonstrate that the government instrumentalized Banro to get hold of the Twangiza area. In turn Banro also made strategic alliances with national and provincial government and local elites.

¹⁷ Protocole d'Accord passé entre les comités des creuseurs artisanaux des chefferies de Luhwindja et de Burhinyi et la société Twangiza Mining Sarl relativement à l'évacuation de la mine de Twangiza. Unpublished document, 05/06/2010. Protocole d'Accord passé entre la chefferie de Luhwindja et Twangiza Mining Sarl, unpublished document, 28/01/2010.

to do this as it perceives the costs to outweigh the benefits. A sustainable solution is yet to be found.

4. The future of ASM: suggestions for future interventions

4.1. Role of the state

The problem for mining sector reform to address has been presented by the international community as that of a legitimate government versus illegitimate armed groups requiring the strengthening of government and the imposition of rules and order to achieve peace and development. Yet this is only a partial analysis, which leads to a serious misreading of the situation. A whole range of governmental and non-governmental and militarised and non-militarised actors latch onto the mining sector in the hope of extorting taxes [21], and violence is not the reserve of non-state actors. Indeed, Congolese state officials – including members of the army, police, and administration - are today responsible for the largest part of all human rights violations [38]. Furthermore, the ‘informal’ sector only appears unregulated and chaotic to an outsider, or from a statist perspective. In fact, it adheres to its own norms and order [7].

Seen in such a light, defining legal or illegal actions, conflict or non-conflict areas, and regulated or unregulated practice becomes a far murkier process, and the response of current mining reform initiatives to sanctify the role of the state is problematized. Wider governance reform is desperately needed before the Congolese state can realistically be expected to play a non-predatory, positive role in mining sector reform. While a range of private and non-state actors currently finance and directly support the implementation of a number of top-down governance initiatives in the mining sector, it remains to be seen how and when the state will take ownership of these initiatives, raising serious question marks as to their sustainability.

However, before such wider governance reform takes place, there are existing locally-developed governance systems and structures that may be deserving of more attention and support. In order to meet the needs of artisanal mining investment, for example, gold traders hand out credits to shaft managers and thus build up ‘trust networks’ which are governed by specific rules and norms [37]. Further research to identify such forms of local governance may provide fruitful entry points for interventions to support and strengthen social and economic institutions that have evolved to promote ASM in a hostile environment, providing they function along inclusive, non-discriminatory lines.

4.2. Making artisanal mining viable

We have already pointed to the importance of artisanal mining for mineral production, the local and regional economy, and livelihoods in the Kivu provinces. The question now is whether this sector is viable in the mid- and long-term, and has the potential to contribute to broader development. This will depend on at least two factors: its geographical viability, and its economic viability. Not enough research has been done to assess these considerations in the DRC. Yet with respect to geographical viability, it is commonly accepted that industrial and artisanal mining typically target different deposits [39]. Industrial mining can exploit deeper veins and depends on efficiency calculations on the basis of costs, volumes and grades. Artisanal mining faces lower labour and technical costs, which may make minerals with lower grades economically profitable. Artisanal miners can also exploit deposits with lower volumes, as well as sites that are difficult to access, for example because of a lack of transport infrastructure. Inside the vast concessions that

have been granted to companies in South Kivu, it may well be possible to identify deposits that are better suited to artisanal mining, especially for gold (interview mining engineer, Brussels, 25/02/2013). This may be a reason to negotiate with Banro over an arrangement to put parts of its concession at the disposal of artisanal miners. We also mentioned the ‘dormant’ titles, held by companies that may never have had the intention to explore or exploit. Currently there are rumours that the Ministry of Mines will invalidate some of these titles (personal communication cooperative leader, 25/01/2013). This would be an opportunity to create new artisanal exploitation zones.

Beyond these possibilities, cooperatives have a potentially significant role to play in ensuring the future viability of the ASM sector. Yet the creation of cooperatives is a difficult process, as we have indicated, and in the context of South Kivu it is all too often politicised. The Mining Code has a vision of cooperatives as small production units, evolving into business units. This requires considerable financial capital, technical knowledge, and material resources. Currently operators of underground pits commonly make use of water pumps to evacuate the groundwater and compressors that supply oxygen inside the shafts [7]. In some sites miners use ‘crushing machines’ to crush the hard rocks (for example in the gold mine of Misisi), while in other mines this work is done manually. These kinds of investments in small machines may considerably improve working conditions and increase production output.

Access to financial credit is therefore crucial. Today access to credit is limited for cooperatives given the weakness of the banking system and the unstable situation in which many cooperatives in South Kivu find themselves. One possibility faced with this context could be for cooperatives to act as credit unions; democratically run organisations using pooled funds from members to invest in machinery and materials to improve their own working conditions, as well as to make loans to members to improve their socio-economic situation. If a cooperative has 200 members, and each member contributes \$2 per month, it is easy to see how quickly capital could be accumulated and put to good use. Yet it remains to be seen whether such a model can be successfully replicated in the Congolese context.

In the meantime, technical and material assistance to artisanal miners should be provided by Saesscam, the technical service of the Ministry of Mines. Yet Saesscam lacks the human, financial and material resources to carry out its tasks, which include improving working conditions and productivity, encouraging miners to work in accordance to the Mining Code, stimulating the creation of cooperatives, participating in the creation of credit sources for miners, monitoring mineral flows, and collecting taxes [12]. According to the miners and traders in South Kivu, this last responsibility, tax collection, currently takes precedence over all others. The agency clearly needs to be strengthened so that it can also take up its other responsibilities, yet this may be a part of the wider governance reform touched on above. Indeed, so urgent is the need to reform Saesscam that a recently published report has called for it to either be reorganised or closed down [8].

4.3. Broader local development

While further research is needed to investigate whether and to what extent artisanal miners are combining their mining activities with other income-generating activities, such as agriculture [40, 41, 42], there have been some initiatives to provide alternative livelihoods for former artisanal miners. The company Banro, for example, trained a few hundred former miners in various professions, as we have noted above. This programme may have brought some relief to the miners and their families in the short- and medium-term, but it is not obvious that this will also be the case in the long run (focus groups in Twangiza, 08/01/2011 and 10/01/201). First, the number

of beneficiaries was small relative to the total population (an estimated 6,000 to 12,000 miners). Second, with respect to the selection of the beneficiaries, various sources confirmed that many miners refused to register, while some people complained about favouritism on the part of the local authorities. Moreover, the programmes might have been aligned more closely with the local labour market. Finally, one of the programmes has been implicated with the embezzlement of funds. Nonetheless, Banro has continued to consider ways of dealing with the reintegration issue. In 2012, it opened up a credit line for local companies intending to employ former miners. The two projects that have been approved thus far should provide jobs in small agro-businesses for a few hundred former miners (Mining Ministry int. 28/09/2012). Yet the critical point remains the broader socio-economic development of the province. As long as there is no job creation, and agriculture - which is still the main livelihood for the majority of households in South Kivu - remains unattractive to young people because it generates little money, alternative livelihood promotion will face considerable challenges.

Of perhaps more immediate interest, in the summer of 2009, a pilot project to use mobile phones to obtain high-quality, verifiable, and real-time information about events that take place in hard-to-reach areas was launched in South Kivu, under the name 'Voix des Kivus' (Voice of the Kivus)¹⁸. After two years, the pilot found that obtaining verifiable, high-quality data in real-time via mobile phones was possible¹⁹. Furthermore, while the pilot began solely as an information receiver, by 2010 it was successfully sending real-time prices of local goods to mobile phone holders in remote project areas.

This has immediate implications for ASM, which often takes place in some of the country's hardest to-reach places. The real-time data relay system piloted by Voix des Kivus has the potential to help validate remote mining areas so that they can begin official production. Furthermore, it could communicate daily commodity prices to artisanal miners. This would enable miners to ensure they are getting a fair price for their minerals at the point of sale. The very fact that such technology has been demonstrated to work in South Kivu's remote villages also paves the way for the introduction of more sophisticated cell phone technology to stimulate broader local development, such as the Kenyan MPesa system. M-Pesa²⁰ allows users to easily deposit, withdraw, and transfer money with a mobile device. Research on the income of artisanal miners has shown they have relatively high-earning potential, with miners earning \$12-15 per day [12]. The problem is that, working in isolated and insecure areas, they have very little option but to spend it on site, as it is earned²¹.

If, however, they were able to easily and safely deposit and transfer money via their phones, this would not only allow for savings but the sending of remittances back to families would boost local investment and development and become a driver for other sectors such as agriculture and livestock. Primary research undertaken by local organisation B.E.S.T. suggests that literacy and numeracy levels of workers in mining areas would need to be raised for such a system to be effective (personal communication B.E.S.T. Manager, 07/03/2013), and the introduction of M-Pesa-style technology to the eastern DRC is certainly not around the corner. However, more

¹⁸ The pilot was led by Columbia University and supported by a grant from USAID.

¹⁹ For more information on these results, see <http://cu-csds.org/wp-content/uploads/2009/10/Voix-des-Kivus-Leaflet.pdf> and <http://www.frontlinesms.com/wp-content/uploads/2011/08/Case-Study-Voix-des-Kivus-final.pdf>.

²⁰ See <http://www.guardian.co.uk/money/2007/mar/20/kenya.mobilephones> or <http://www.bbc.co.uk/news/business11793290> for more information.

²¹ Researchers have described a variety of money handling habits by artisanal miners, among which immediate consumption, but also more sustainable investment patterns. Sometimes a distinction is made between money earned in agriculture – which is believed to be used for more sustainable investments – and money earned in mining [43], or money earned in gold panning – more stable and sustainable - and in diamond mining – more risky and suitable for immediate consumption [44, 45]. See also [46].

projects along the lines of Voix des Kivus are needed to further research the feasibility of mobile phone technology, and its potential to drive local investment and development by enabling miners to sell at a fair price, save money and send remittances back to their communities.

5. Conclusion

This article has aimed to assess, on the basis of empirical evidence from South Kivu, what the future may hold for artisanal mining in the eastern DRC. Early evidence shows that the range of new initiatives to regulate and formalise the mining sector have failed to have a positive impact for ASM. They have focused too much on the ‘conflict minerals’ issue, assuming a universal link between resources and conflict, and assuming that breaking this link means putting an end to the conflict. We argue that a more comprehensive and contextualized view is needed in order to deal with a variety of problems in artisanal mining. Looking to the future, we have provided suggestions for initiatives to promote a viable artisanal mining sector which contributes to broader local development. First, we have argued that wider governance reform is desperately needed before the Congolese state can realistically be expected to play a non-predatory, positive role in mining sector reform. Second, that a number of factors must be considered by policymakers and reformers to create a viable future for ASM, namely: its competitive advantage over industrial mining in exploiting lower grade, lower volume, and difficult to access deposits; the opportunity presented by ‘dormant’ mining titles to open new artisanal exploitation zones; the potential of mining cooperatives to improve the working conditions and status of miners, and their need to access or generate financial credit; and the urgent need to reform and strengthen Saesscam. Third and finally, we have discussed alternative livelihood promotion which, while capable of a positive impact on those targeted, ultimately faces multiple structural challenges limiting its potential. Of more immediate interest may be the introduction of mobile phone technology in mining areas, which has the potential to drive local investment and development by enabling miners to sell at a fair price, save money and send remittances back to their local communities.

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