UvA-DARE (Digital Academic Repository)

Is the god of diamonds alone? The role of institutions in artisanal mining in forest landscapes, Congo Basin

Schure, J.; Ingram, V.; Tieguhong, J.C.; Ndikumagenge, C.

DOI

[10.1016/j.resourpol.2011.09.002](https://doi.org/10.1016/j.resourpol.2011.09.002)

Publication date

2011

Document Version

Final published version

Published in

Resources Policy

[Link to publication](#)

Citation for published version (APA):

Schure, J., Ingram, V., Tieguhong, J. C., & Ndikumagenge, C. (2011). Is the god of diamonds alone? The role of institutions in artisanal mining in forest landscapes, Congo Basin. *Resources Policy*, 36(4), 363-371. <https://doi.org/10.1016/j.resourpol.2011.09.002>

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (<https://dare.uva.nl>)

Is the god of diamonds alone? The role of institutions in artisanal mining in forest landscapes, Congo Basin

Jolien Schure^{a,*}, Verina Ingram^a, Julius Chupezi Tieguhong^b, Cleto Ndikumagenge^c

^a Center for International Forestry Research (CIFOR), Central Africa Regional Office, P.O. Box 2008, Messa, Yaoundé, Cameroon

^b Technical Training and Research Centre for Development (TTRECED), Yaoundé, Cameroon

^c International Union for the Conservation of Nature (IUCN-PACO), Central and West African Office, Yaoundé, Cameroon

ARTICLE INFO

Article history:

Received 25 January 2011

Received in revised form

31 August 2011

Accepted 5 September 2011

Available online 5 October 2011

JEL classification:

Q230

Q380

Keywords:

Artisanal mining

Diamond

Gold

Cameroon

Central African Republic

Institution

ABSTRACT

This paper examines the institutional framework of artisanal mining in the forests of the Sangha Tri-National Landscape (TNS) in the Congo Basin. Artisanal miners in Cameroon and the Central African Republic (CAR) commonly make sacrifices to their god of diamonds, to improve fortunes. This study looks into 'the other forces'; institutions that play a role in shaping the sector and its outcomes. These institutions comprise formal and informal institutions at a local, national, regional and international level. Although artisanal miners in TNS benefit by gaining cash income, this activity also carries risks as income is highly disparate and environmental impacts in this priority forest conservation area are expected to increase due to the growing competition over land use. It was concluded from a literature review, interviews and site visits that informal arrangements dominate the sector, especially in Cameroon, leading to poor relations between officials and miners and meaning that miners have few rights and no voice. The current institutional setup is inadequate to deal with current and anticipated social and environmental issues. Future interventions need to take into account the existing (local) types of organization, vulnerable groups, the interests of multiple actors and the fact that most miners are experienced but combine mining with other activities, such as agriculture, fishing and harvesting forest products. African initiatives concerning ASM offer opportunities to Cameroon and CAR to collaborate with other countries to combat similar issues. A regional integrated approach of both the forest and mining sector would be especially relevant for trans-boundary agreements, such as concerning the TNS, to reinforce positive outcomes for the landscape and the area's population.

© 2011 Elsevier Ltd. All rights reserved.

Introduction

Gold and diamond deposits have been found throughout the Congo Basin and are the two major minerals exploited in the Sangha Tri-National Landscape (TNS) in Cameroon, Central African Republic (CAR), and the Republic of Congo (RoC). The mineral sector of CAR and Cameroon is small in comparison to major Central African producers such as Angola and the Democratic Republic of Congo (DRC), and is confined to mainly artisanal, small-scale production (Sale, 2006). Gold mining in Cameroon started in 1933 and recent estimations of Cameroon's annual artisanal production are 1500 kg of gold and 12,000 carats of diamonds (Newman, 2010). In CAR, mining also started in the 1930s with alluvial discoveries, with gold production peaking in the early 1980s at 521 kg and diamonds at 609,360 carats in 1968. CAR

reported a production of 311,779 carats (valued at 47 million US\$) in 2009 (Kimberley Process, 2010).

Artisanal and small-scale mining (ASM) is labor intensive and requires few capital and technical investments, which means it typically provides a substantial contribution to local development in the form of employment and cash income. Its importance to livelihoods has become increasingly acknowledged after decades of criminalization, informality and this sector of the economy being overlooked in the majority of developing countries.

However, besides the potential of the sector to contribute further towards poverty reduction, recent studies have underlined a range of negative issues related to its operations. These are primarily associated with social and environmental impacts, with frequently raised concerns about

- miner's health and safety, including the vulnerable position of children working in mines (Walle and Jennings, 2001; Hilson, 2008);
- informality and lack of legal status (Siegel and Veiga, 2009; Sinding, 2005);

* Corresponding author. Tel.: +237 22 22 74 49/51.

E-mail addresses: j.schure@cgiar.org, jolien.schure@gmail.com (J. Schure).

- poverty traps and dependence, particularly in rural communities with a heavy reliance on mining as the sole economic engine, reinforced when miners cannot reinvest, middlemen control finances and (specific groups of) miners have little bargaining power (Hilson and Pardie, 2006; Fisher, 2007; Sinding, 2005);
- conflicts over land and resettlement, mainly between government, small-scale miners, large-scale operations and the local population who practice agriculture at the same site (Hilson and Potter, 2005; Hilson et al., 2007) and
- environmental impacts: water and air pollution (notably from metals and chemicals used, such as mercury for gold amalgamation) river and dam siltation, unrecovered open pits and loss of biodiversity (deforestation, over-fishing and poaching) (Babut et al., 2003; Hentschel et al., 2002; Shandro et al., 2009).

These concerns have arisen in response to an increase in artisanal mining activity, especially in areas characterized by high biodiversity, sensitive landscapes and where people are poor.

To counter negative impacts, an array of technology, support-related and poverty-reduction projects focusing on ASM have been implemented over the past 20 years. Whilst difficult to generalize the outcomes of these interventions, many efforts have been criticized for having inadequately addressed miners' needs (Sinding, 2005; Hilson and Banchirigah, 2009). Common lessons that can be drawn include

- ASM support projects should consider the realities and needs of miners when proposing technical assistance or alternative activities (Hilson and Banchirigah, 2009; Tschakert, 2009).
- Power relations between and among households and local organizations need to be taken into account and miners need a voice to avoid further exclusion of already vulnerable groups (Fisher, 2007).
- It is not always clear whether legalizing mining activities have actually helped the poor. A better understanding of the conditions for 'effective formalization' is needed to know, how, and, under what conditions, this can contribute to economic and social development (Siegel and Veiga, 2009).
- ASM reforms should encompass good sector governance and appropriate policies, regulations, and fiscal regimes in the country. However, implementing these policies on the ground requires institutional capacity and sometimes expensive monitoring mechanisms that are not always feasible in poor or post-conflict countries (Sinding, 2005; Maconachie, 2009).

Enabling positive governance outcomes at different levels entails understanding 'institutions'. Institutions can be defined as 'regularized patterns of behavior that emerge from underlying structures or sets of rules in use' (Leach et al., 1999: 266). Institutions manifest themselves at the local to global levels and one can distinguish between 'formal institutions' that follow official rules and laws and 'informal institutions' that consist of unwritten rules and arrangements between actors (Wiersum, 2009: 4). The latter 'informal institutions' seem especially relevant in the ASM sector that is often characterized by customary law and practices.

This paper provides an overview of ASM in the TNS Landscape and looks at the institutional arrangements for mitigating negative outcomes and promoting sustainable livelihoods. First, it summarizes the main findings about the livelihoods and environmental impacts of artisanal mining, based upon research executed in 2008 and 2009. Secondly, the institutional framework at local, national, regional, and international level is analyzed to respond to the question of whether the current institutional setup

is adequate to deal with issues around artisanal mining in the TNS Landscape.

Methodology

Study area

The study area is the Sangha Tri-National Landscape (TNS) shared by three countries: Cameroon, the Central African Republic (CAR) and the Republic of Congo (RoC) (located at 3°32'12"N; 15°28'26"E–17°34'8"E see Fig. 1). The landscape contains a rich variety of flora and fauna. It is comprised of 93% dense rainforest, 5.6% mixed swamp forest and less than 1% of the area is grassy clearings and forest cultivation mosaic. The forests of the Landscape, with protected areas covering 21.5% of the entire surface (752,000 ha), have been recognized as one of the priority areas for forest conservation in the northwest Congolese forests ecoregion. In 2000, the three countries signed a cross-border cooperation agreement with a view to improve conservation of the protected areas.

The TNS has about 191,000 inhabitants with a very low average density of 0.7 inhabitants/km². Population growth in this area has been estimated at 1.88% (Sandker et al., 2009), which is below the Cameroon average of 2.67% but slightly above the rural population growth rate of 1.18% (UNDP, 2009). The major economic activities around the landscape include logging, mining, hunting, fishing, agriculture, livestock breeding, gathering, conservation and tourism and trade (CBFP, 2006; Tieguhong et al., 2009). Household surveys conducted in the South East Technical Operational Unit indicate an average income of 250 US\$ per capita per year, which is substantially lower than the average Cameroonian per capita income of 1010 US\$ (Sandker et al., 2009).

Methods and materials

The methods used to collect the data presented in this paper included

- Field visits to 17 mining sites between August and December 2008 (13 in Cameroon and four in CAR) located within 50 km of the TNS for observation and mapping. The Republic of Congo's nearest mining sites (Boloko, Golana and Pandama) were not within the 50 km distance of the TNS and therefore not part of this study.
- Interviews with 131 randomly selected male and female miners (63 gold and 68 diamond miners, representing a sample of approximately 24% of miners in the study sites) and complementary semi-structured interviews with key actors (such as the park conservators, government representatives in charge of mines, forest and the environment, and representatives of international non-governmental organizations).
- A literature review of scientific studies, reports of ministries and support organizations, national laws and regulations, and mining permits.

Analysis of field data followed three phases: data entry, checking and correcting and calculation of descriptive statistics. Data entry was done in the CPro version 3.0 and transferred using Stat-Transfer version 5.0 into SPSS version 12.0 for analysis. Information provided by partners and field organizations was recorded to crosscheck data and to gain a better understanding about the (formal and informal) roles and viewpoints of the various actors. Literature and official documents were analyzed on sector relevant information about ASM in Cameroon and CAR in order to review the existing formal mechanisms.

Fig. 1. Artisanal mining sites in the Sangha Tri-national Landscape.

Results

ASM in the TNS landscape

This first result section presents the general characteristics of ASM in the TNS landscape in order to distill the main issues that would need to be reflected in institutional frameworks.

Livelihood benefits and risks

Most of the miners interviewed (95% in Cameroon and 87% in CAR) had permanent or temporary residence in Zega (CAR), Mboya (CAR), Nguenguili (Cameroon) and Ngola (Cameroon). The average age of miners is 36 years old, and miners generally have many years of experience in the ASM sector (17 years of experience in CAR and 9.5 years of experience in Cameroon). In CAR, no women lead mining activities, whereas in Cameroon 13% of the head miners are women. However, in both countries, most miners are married, and assisted by (family) labor, involving many women and children. The majority of mining activity took place year-round but activities (especially the alluvial mining in the Sangha River) reduced in the rainy season when flooded

conditions impeded the work. Most mining camps had agricultural crops planted, and in some cases livestock (fowls, goats and sheep) was reared.

The livestock was particularly important for the ritual of making sacrifices to the god of diamonds. Fetish practices and sacrifices have been observed among diamond miners in both Cameroon and CAR. For gold mining, these practices are less common. The sacrifices for diamond mining take three forms: gravel washing; women's activities; and children's activities. The 'gravel washing sacrifice' involves the slaughter of a cock, goat or sheep on the extracted soil before washing and sifting it for diamonds. The 'women's sacrifice' demands that the women at the mining site celebrate all night in order to satisfy the god of diamonds. If still nothing is found, a 'children's sacrifice' is conducted (particularly in Ngola, Central African Republic); sweets and candy are bought as a treat for children before the mining expeditions take off.

Mining was the principal activity for 79% and 88% of the artisanal miners in Cameroon and CAR, respectively, although mining is often part of a multiple income generation strategy, combined with up to eight other activities. Agriculture was the second important source of income, followed by non-timber forest product gathering in Cameroon and fishing in CAR.

The livelihoods of at least 5% of the area's population, an estimated 4600 people (517 miners and their dependents, an average of 5.3 in Cameroon and 8.1 in CAR), are based primarily on artisanal mining. All minerals extracted in the region on an artisanal scale are sold unprocessed. Mean annual net incomes from gold and diamonds were 575,338 CFAF (1151 US\$) and 812,644 CFAF (1,625 US\$), respectively, in Cameroon. This represents more than four times the income of the average 'non-miner' in the region (of about 250 US\$) (Sandker et al., 2009). On the CAR side of the TNS, diamond miners profited less with an average annual net income of 368,084 CFAF (736 US\$).

Although the income generally pays for important household needs, the range of income gained among miners is disparate and uncertain; with a standard deviation of up to three times the average income, actual revenues ranged from considerable profit to significant losses. Net annual losses of up to 1,032,450 CFAF (2028 US\$) were found in CAR and 400,000 CFAF (786 US\$) in Cameroon. The risks of losing income were of special concern because most miners did not save any of their income. Ethnicity, education and experience were the major factors in explaining a higher income from artisanal mining, with indigenous Bangandos and Baka pygmies earning considerably less.

Small-scale miners in the TNS offered different views on production trends and problems encountered. In Cameroon, miners believed production was increasing and related that this was mainly a result of increasing prices, hiring labor and purchasing of new tools. On the contrary, miners in CAR said that production was decreasing, blaming over-exploitation and a lack of external support. Miners reported a variety of problems related to their daily activities, the most pressing of which are lack of food and medicine, harassment by conservation officials, dishonesty of their sponsors, low production, harsh government laws and actions, an inability to detect minerals, price fluctuations and lack of capital.

The fact that over three-quarter (90% in Cameroon and 77% in CAR) of the overall income of small-scale miners originates from natural resources – not only minerals, but also NTFP gathering, hunting and fishing – shows the enormous contribution of the natural environment to miners' livelihoods. This raises the question of how environmentally sustainable these activities are, and how artisanal mining activities impact upon the very same natural environment that miners depend on?

Environment: impacts and competition over land use

Local stakeholders interviewed indicated that some miners were operating within the interior of the reserve. The research findings confirmed this; in Cameroon, 20% of the miners indicated that they (also) mined inside the reserve, in contrast with only 1 (out of 32 miners) in CAR. Several related environmental risks were noted by the stakeholders, such as water and soil pollution, disturbing of fish breeding grounds, unrecovered exploited mining pits and poaching of wild animals. However, the overall scale and conduct of artisanal mining in the TNS Landscape was found not to drastically threaten environmental services as these impacts appear to be of limited scale and duration. The majority of mining took place along streams, causing direct but small-scale impacts such as diversions, siltation and sedimentation of water sources. Small surfaces were cleared during the period of mining, which was often seasonal, with only limited farming activities taking place near the mining sites. The indirect effects of working in the forest areas included timber and non-timber forest product exploitation, including bush meat and medicinal herbs, by 21% of Cameroonian and 28% of CAR respondents, who indicated that such activities provided alternative sources of income. No miner reported using mercury or cyanide for gold

extraction, nor had these polluting activities been observed by any of the stakeholders.

This conclusion of small-scale and temporal environmental impacts due to mining, however, could change in the future. Miners' awareness about possible environmental changes is limited; over 53% of the artisanal miners believed that gold and diamond are infinite resources. A concern expressed by various stakeholders is that the buffer zone of the Lobéké National park has been attributed to mining operators under research permit titles. Moreover, a WWF map shows the overlaps of mining and timber concessions with national parks in Southeast Cameroon (WWF, 2008). The competing land uses, together with an expected growth of the number of artisanal miners (migration and an overall estimated population growth in the region of around 1.88% per year), are expected to increase pressure to the landscape.

Artisanal mining and related issues can now be placed in the context of institutional mechanisms that co-determine the managing of risks and opportunities and the eventual outcomes for the population and the landscape.

Legal and institutional mechanisms

How formal and informal forms of organization are perceived and structured at the local level is first presented, followed by an analysis of the key institutions at a national, regional and international level.

Local institutions

Of the miners interviewed, over 70% and 63% in Cameroon and CAR, respectively, worked for themselves. Mining in groups or cooperatives was unusual, except for the project by the Cameroonian Support and Promotion Framework of Mining Activities Organization (CAPAM). About 29% in Cameroon and 37% in CAR were working for sponsors, who purchase materials, food and medicine for their workers. Mining sites are commonly headed by a site chief (*chef de chantier*), usually the oldest or the most experienced person, who retains special mining rights and exercises leadership at the camp. For example, the chief of a diamond-mining site in Ngola (CAR) was informally entitled to 25% of sales. Formally, the chief is obliged to pay an annual government tax of 30,050 CFAF (59 US\$).

There was no organized sale of products in the TNS; each miner sells winnings individually to buyers. The buyers, generally known as collectors, travel to buy the minerals at pre-determined prices and the miners have little bargaining power. Especially for diamonds, for which the prices depend on different factors such as color, clarity, weight, and shape, miners lack the skills, equipment and market information to determine the value (selling prices per stone vary from 5000 to 600,000). Small-scale miners who work for sponsors are expected to be loyal and sell their products exclusively to their sponsor; harassment results when a miner has been discovered selling to another buyer.

When asked about government support for small-scale mining in the TNS, 67% and 53% of miners in Cameroon and CAR, respectively, indicated that it was completely absent. However, 29% in Cameroon mentioned education and technical training, specifically referring to the diamond miners in the Mboy region, where the government agency CAPAM has been providing equipment and technical assistance to small-scale miners since 2006. At Mobilong, CAPAM gave motorized pumps to artisanal miners free of charge, which otherwise are rented at 5000 CFAF (10 US\$) per day. The miners of this site attributed the fact that they have accumulated capital to the support they received from CAPAM.

Table 1

Types of government support of ASM in TNS.

Government support or program	Frequency	Percentage by country	Overall percentage in TNS
<i>Cameroon</i>			
Education	1	1	1
Technical training	28	28	21
Exploration equipment	4	4	3
No support	66	67	50
Subtotal	99	100	76
<i>CAR</i>			
Education	9	28	7
Technical training	4	13	3
Exploration equipment	2	6	2
No support	17	53	13
Subtotal	32	100	24
<i>Total</i>	131		100

In CAR, education and technical training accounted for 40% of the government support identified by miners (Table 1).

When artisanal miners were asked if they had experienced problems during operations, it was revealed that government agents, conservation officials and individual buyers caused harassment. Government agents are the major source of harassment in CAR, but conservation agents were the leading source in Cameroon. Strategies for dealing with such problems in Cameroon were to run away (22%), bribe the controller (11%), speak angrily (33%) or stay quiet (33%). In CAR, artisanal miners either react by speaking angrily (64%) or show their papers to prove that they are operating legally (36%). Miners revealed that transport to the market was usually problem free, explained by the fact that the small volume–high value of the product makes it largely undetectable by government officials.

Artisanal mining in the TNS region is informal and largely illegal, especially on the Cameroonian side where none of the interviewees confirmed having paid tax of any kind or having a legal mining permit. The delegate of mines, for the Boumba and Ngoko division in Cameroon, indicated that miners do not want to follow the rules and regulation of the sector and refuse to pay the yearly 5000 CFAF (10 US\$). In CAR, a little over 56% of the artisanal miners pay taxes and possess an annual mining card; miners pay an annual laborers' tax of 2000 CFAF (4 US\$) and the site head pays an annual tax of 30,050 CFAF (59 US\$). Collectors or buyers pay an annual tax of up to 1,100,000 CFAF (2,160 US\$). The higher level of legality in CAR demonstrates that regulation is possible. The miners who had legal papers in CAR mentioned that the benefit of having papers was the freedom to exploit and sell minerals. About 62% of the artisanal miners in Cameroon and 81% in CAR reported not being aware of the respective country's mining code. Local stakeholders expressed the need for sensitizing miners on the code and legalizing of their operations.

Despite the fact that 'harassment by conservation agents' and 'harsh government laws and actions' are mentioned as problems, miners do consider the government as the main actor with power to assist. Over two-thirds of the miners in both Cameroon and CAR believed that the government should help them obtain materials such as tools or ensure sensitization of the mining code (Table 2). Artisanal miners called furthermore for greater transparency in sales offices, reduction in the costs of obtaining legal papers and stabilization of prices.

National institutions

Cameroon and CAR both have a foundation for good sector governance with a legal framework structured by a Mining Code,

Table 2

Opportunities suggested by artisanal miners in TNS for resolving problems.

Opportunity/request	Frequency	Percentage by country	Overall percentage in TNS
<i>Cameroon</i>			
Assistance to obtain working materials	55	49	38
Assistance to obtain legal papers	26	23	18
Open a sales agency in village	10	9	7
Stabilize prices	6	5	4
Create a cooperative	9	8	6
Receive training in modern mining techniques	7	6	5
Subtotal	113	100	77
<i>CAR</i>			
Assistance to obtain working materials	12	36	8
Assistance to obtain legal papers	10	30	7
Open a sales agency in village	4	12	3
Stabilize prices	1	3	1
Create a cooperative	6	18	4
Subtotal	33	100	23
<i>Total</i>	146		100

Tax Code, Land Tenure Code and regulations on the environmental and protected areas.

In Cameroon, the main bodies dealing with geology and the mining sector are the Ministry of Industries, Mines and Technological Development (MINIMIDT), which also has the responsibility for the national geological survey and the Ministry of Scientific, and Technical Research, an agency that oversees a variety of research institutions in the areas of geology and geophysics, hydrology, and energy. Mining activities are regulated by a legal framework comprising the Mining Code under MINIMIDT; Tax Code including customs, labor and investment codes under the Ministry of Finance and Environmental Code under the Ministry of Environment and Nature Protection.

The legal framework for Cameroon's mining sector follows French law. The Mining Code consists of a law (1964) which regulates mineral substances, and another law (1978) which defines royalties and mining taxes. The latter was supposed to define the fiscal framework for mining, but this did not happen until 2001 when the new Mining Code (Law No. 1 of April 2001) was promulgated with the assistance of the World Bank. According to the code, all mineral resources belong to the state. Prospecting, exploration and mining activities for any mineral deposit are regulated by permits, which are awarded for quarrying, prospecting/research, exploration, exploitation and mining concessions. The Mining Code differentiates between ASM and LSM but at the same time, gives provisions for the two to operate at the same site, recognizing its importance for the livelihoods of local people and referring to the fact that the former goes to less profound depths than the latter. A related challenge recognized by the Mining Code is to mitigate problems caused by both ASM and LSM operations in the same area (Republic of Cameroon, 2001). However, there have not been any practical tools developed to date to deal with the situation of ASM versus LSM.

The creation of the Support and Promotion Framework of Mining Activities Organization (CAPAM), in 2003, followed a new provision of the 2001 Mining Code enabling the setting up of an autonomous unit to facilitate, assist and promote small-scale mining and aid up scaling to large-scale mining operations. In 2006, CAPAM channeled 50 kg of gold and 300 carats of diamonds in its market facilitation structure. The revenues are being used to invest in materials, pay tax (3% for gold, 8% for diamonds) and 15% goes to the local council, 10% to the local population and 25% to the monitoring and control organ. One of

the advantages for the miners would be greater certainty about prices for their production with the help of sales according to an approved price list. This approach appeared difficult to implement; miners were not well informed about the price list and still had no capacity to determine the diamonds' quality and value category. In 2008, the purchase of diamonds from artisanal miners by CAPAM was suspended by the Minister.

The mining sector in the CAR falls under the responsibility of the Ministry of Mines and Energy. The General Directorate of Mineral Resources implements the law and policies regarding mining permits. The Mining Code of 1961 was revised in 2004 in order to stimulate investments in the sector and to establish an organization responsible for geological exploration and prospecting claims (CAR, 2004). By law, all mineral resources in the ground or at the surface are property of the State and access can be granted by means of permits. The new Mining Code defines six categories of permits, including artisanal mining. The permits serve different purposes, subjected to various surface areas, validity and delivery authorities and provide for exclusive mining rights on the defined property (CAR, 2004).

The *Bureau d'Évaluation et de Contrôle de Diamant et d'Or* (BECDOR) was established in 1982 to oversee the internal diamond market and to value official exports. It also maintains a database concerning all statistics about diamond production and trading in the country. BECDOR estimates that there are approximately 50,000 licensed diamond diggers in the CAR. Labor taxes are collected from 56% of the miners. The artisanal miners sell their production to about 160 certified collecting agents who, in turn, sell this production to two purchasing offices located in Bangui.

African, regional and international institutions

The African Charter on Human and Peoples rights states that: 'All peoples shall freely dispose of their wealth and natural resources. This right shall be exercised in the exclusive interest of the people. In no case shall a people be deprived of it' (Organization of African Unity, 1981: 6). Since the early 1990s there has been an increase in attention to ASM issues in and by African countries, reflected in a series of events. In 1993, a United Nations event took place in Harare, where a first set of guidelines on ASM in developing countries was drafted to promote it as a legal and sustainable activity (Labonne, 1994). The World Summit on Sustainable Development in Johannesburg in 2002 further promoted debate and initiatives on 'sustainable mining'. One of the actions formulated is to 'foster sustainable mining practices through the provision of financial, technical and capacity-building support to developing countries and countries with economies in transition for the mining and processing of minerals, including small-scale mining' (UN ESA, 2005: article 46). In the same year, the Yaoundé vision statement about ASM provided clear objectives on which goals to achieve for sustainable reduced poverty and improved livelihoods within the ASM sector by the year 2015 in line with the Millennium Development Goals (UNECA DESA, 2002). The first African Union Conference of Ministers of Mines in October 2008 referred to this statement when it first discussed the African Mining Vision (AMV), which was endorsed by the member states in February 2009. One of the six intervention points of this vision is to develop policies concerning ASM 'to stimulate local/national entrepreneurship, improve livelihoods and advance integrated rural social and economic development (African Union, 2009: 3)'. An International Study Group (ISG) on Africa's mineral regimes, informed by the AMV is working towards proposing new policies in line with this societal development perspective (UNECA, 2010).

At a regional level, different institutions, such as the Economic Community of West African States (ECOWAS) and Southern

African Development Community (SADC) are making steps towards harmonizing their policies and developed the 'Draft ECOWAS Directive on the Harmonization of Guiding Principles and Policies in the Mining Sector' and SADC's 'harmonization of Mining Policies Standards, Legislative and Regulatory Frameworks in Southern Africa' (Bijlsma, 2011). In September 2009, the Economic Community of Central African States (ECCAS) of which Cameroon and CAR are members also announced its intentions for standardizing the mining codes of member states for more transparency and better governance of its extractive sector (Les Afriques, 2009). These regional initiatives can be especially relevant to solve cross-border issues. Cross-border smuggling for example, results from different institutional contexts or differences in mineral taxes between countries. This is the case for Cameroon and CAR where institutional differences are mainly the fact that Cameroon is not an applicant of the Kimberley Process (see next paragraph) and has less visible formal organization when it comes to ASM. In addition, the countries have different official tax bases (8% diamond tax in Cameroon and 12% diamond tax in CAR) (Barthélémy et al., 2008).

Regarding the forest sector, the Yaoundé Declaration signed in 1999 by the governments of six Central African countries; Chad, Cameroon, CAR, Republic of Congo, Equatorial Guinea and Gabon, set the foundation of the Central African Forest Commission (COMIFAC) and became an important agenda for cross-regional conservation and development goals. It resulted in cross-boundary agreements, among which the agreement between Cameroon, CAR and Republic of Congo about conservation of the TNS Landscape. The 2005 Brazzaville Treaty and the adoption of the Convergence Plan (*Plan de Convergence*) by ten African countries – Burundi, Cameroon, CAR, Chad, Democratic Republic of Congo, Equatorial Guinea, Gabon, Republic of Congo, Rwanda and Sao Tome and Principe – created the provision of free cross-border movement of park guards in the TNS (Carroll, 2008). However, at no point do the agreements that followed the Yaoundé Declaration involve ASM as integral part of discussing conservation and development in forest landscapes.

At the international level, artisanal mining and its potential for development have received increasing attention over the past decade. Focusing on the most relevant international and regional initiatives and the involvement of Cameroon and CAR, four are relevant to the ASM sector.

The Communities Artisanal and Small-scale Mining (CASM) is a global networking and coordination facility with a stated mission 'to reduce poverty by improving the environmental, social and economic performance of artisanal and small-scale mining in developing countries'. CASM is currently chaired by the UK's Department for International Development, and is housed at the World Bank headquarters in the United States. CASM Africa has its secretariat based in South Africa (CASM, 2010). Central African countries can benefit from its facilities but until now, they have not really taken advantage of them.

The International Labour Organization (ILO)'s Convention on Safety and Health in Mines, 1995 (No. 176) covers all mines and provides the minimum safety standards against which all mine operations should be measured. The Convention sets out procedures for reporting and investigating accidents and dangerous occurrences in mines. Governments that ratify it undertake to adopt legislation to monitor and regulate various aspects of safety and health in mines (Walle and Jennings, 2001). So far, none of the Central African countries have ratified the convention (ILO, 2010).

The Extractive Industries Transparency Initiative (EITI) followed a 2003 conference to improve transparency of oil, gas and mining payments by companies to governments. The general idea is that revenues from oil and mining would become public

information, and would be spent in a more transparent manner to benefit the country's population. At a country level, a first step is the foundation of a multi-stakeholders group with representatives of government, companies and civil society, which works towards an action plan with rules for disclosure and monitoring. CAR has the status of EITI candidate country with until November 2010 to validate its work plan. CAR has diamond-mining companies as partners in the stakeholder forum. Cameroon is also a candidate country of EITI and has reported revenues from mining exploitation over 2006–2009 in its 3rd report published in August 2010 (EITI, 2010). Until now, ASM has not been part of the EITI discussion (Valéry Nodem, representative member-organization of Publish What You Pay (PWYP) Cameroon, pers. comm.). Implementation of EITI in these countries and increased transparency of revenue flow from the sector could provide openings for increasing transparency and recognition of the ASM sector.

The Kimberley Process was initiated by African diamond-producing countries in May 2000 to develop an international certification scheme for rough diamonds in order to prevent conflict diamonds from entering legitimate markets. This process, supported by the World Diamond Council and the United Nations, and implemented by a United Nations vote in 2003, requires the certification of all diamonds mined and upon every transfer of ownership of the rough diamonds. (See for example the work of Paes (2005), Le Billon and Nicholls (2007) and Haufler (2009) for critical reflections on the Kimberley's achievements and failures as conflict prevention mechanism). At present, Côte d'Ivoire is the only country under embargo by the United Nations for the export of conflict diamonds; this occurred in December 2005. The CAR, DRC, Gabon and Republic of Congo are currently member countries. In 2007 Cameroon affirmed its intention to join the Kimberley Process but this has not been put into practice yet. Cameroon joining the Kimberley Process will be important for improving monitoring mechanisms and monitoring cross-border trade.

Discussion and concluding remarks

In the Sangha Tri-National Landscape, artisanal mining activities have had both negative and positive impacts. It is questionable, however, whether the current institutional arrangements are capable of addressing the sector's negative aspects. Adequate institutional mechanisms not only refer to the laws and regulations of the countries but involve also the 'informal institutions' at various levels and their ability to deal with challenges around ASM. As identified in the introduction, main challenges are: knowing the limits and opportunities of external interventions; understanding power relations between actors; and finding out what 'effective formalization' and 'good sector governance' should entail in the specific TNS context.

The study results indicate that mining in the TNS landscape contributes significantly to livelihoods, as diamonds and gold provide on average higher levels of income than alternative activities for over 4600 miners, laborers and dependents in the landscape. Nevertheless, the huge income range of miners shows the high financial risk some of the miners carry and overall incomes are still too low to lift households out of poverty. The challenge to educate miners on how to avoid wide income swings and losses and improve incomes is not sufficiently embedded in current policies or activities of the government, development organizations or private sector in either country.

Armstrong's et al. (2008) study of the artisanal diamond sector, lists some recommendations for improving revenues, including improving knowledge about pricing and technology; improving

access to lower-risk credit; making accessible and competitive licensed buyers or buying offices; joining fair trade initiatives and value-added activities and local processing of the minerals. For knowledge transfer to be effective, programs should accommodate local needs and show its use in terms of profitability, simplicity and efficiency to increase benefits with minimum health and environmental risks (Hinton et al., 2003).

An expected outcome of making ASM more profitable through support initiatives is that more people will be attracted to the sector. This is even the purpose of the Cameroonian support agency CAPAM, which aims to increase the number of small-scale miners from the estimated 20,000–30,000 to a workforce of 60,000 (CAPAM, 2006). This carries the risk of increasing dependency of many on this finite source when it is not embedded in wider development strategies (Vlassenroot and Bockstael van, 2008).

Diversification of livelihoods, often recommended as way to improve the sustainability of ASM (Hinton et al., 2003), would clearly be nothing new to the miners in TNS, who, although largely dependent on mining incomes, conduct up to eight additional income earning activities. Livestock rearing is not only important for protein intake and cash income, but also serves to make sacrifices to the god of diamonds. Deliberate government or external support programs on diversification of income opportunities should build upon these activities that miners already practice.

A first step of outside intervention programs is often the organization of miners in groups. The logic behind grouping miners is to have them share investment costs and benefits and at the same time to have an entity with whom the government or development agency can work. The problem with organizing miners is that it often builds upon a false assumption that the sector is 'chaotic and unorganized, when in fact it is highly organized' (Hilson, 2008: 223). The picture drawn in this study confirms this, as it shows miners who have been in the business for a long time and although not 'formally', are already highly organized in mining camps. This level of organization could offer a good entry point for supporting wider issues, such as the by the miners expressed wish for obtaining tools and legal papers. Current experiences of the activities of CAPAM in Cameroon could provide valuable context specific lessons for future intervention programs.

A key point of institutional attention for any support program includes addressing power relations, between and among the actors, in order to avoid further inequality and marginalization of certain groups. Logistical support must not only exist but need also to be considered accessible by the miners (Sinding, 2005). Especially the process of issuing mining titles is prone to exclusion and can eventually lead to abuse of vulnerable groups by other miners and mining companies (Fisher, 2007). The study findings show the average lower revenues of the indigenous Bangandos and Ba'aka/Baka pygmies compared to other miners. Currently there is no institutional arrangement to disseminate knowledge from the migrant miners with better skills, capital and educations to indigenous groups.

An aspect of power relations are the so called 'vested interests' in the valuable mineral sector, which should be identified before any reform takes place (Hilson, 2009; Maconachie, 2009). The actors with vested interests in mining in TNS are the miners, the site chiefs, intermediaries and sponsors. Miners much depend on the site leader and sponsor for their revenues. The site chiefs, who receive a percentage of miners' income based on informal arrangements, are not likely to support a permit system when this would endanger their revenues. On the other hand, awareness raising about benefits of mining titles for miners could entice them to become part of a formalization process and become less dependent on their current sponsors.

Formalization is often considered as the way forward for integrating ASM into the national economy and building a mechanism to look into sustainability and livelihood issues. With one-fifth of Cameroonian miners already operating within protected areas of TNS and an expected increase of ASM and LSM activities in the area, maintaining the current low level of environmental impacts will only be possible if policy measures are enacted. Balancing improvements and formalization in the sector with measures to discourage mining inside the protected areas are key priorities. Three elements for ASM formalization are 'a legal and regulatory framework ensuring security of tenure and property rights, acknowledging the necessary participation of local authorities and backed-up by a sound geological survey and cadastral system; the delineation and creation of artisanal mining zones; the use of miners' identity cards' (Armstrong et al., 2008: 110). The first two elements are not sufficiently embedded in current ASM practices in CAR and certainly not in Cameroon where the sector is largely informal and the low or non-existent level of tax payments do not enable government agencies to channel revenues from the sector back to support it.

Miners at the Cameroonian side of TNS do not carry mining permits. In CAR, 56% of the miners interviewed do possess a license and pay the annual tax. For miners to voluntarily pay their license, they first need to believe that the tenure and tax system will provide them with some benefits. This asks for real benefit transfer within the system and awareness raising about these advantages. Benefits may come from tenure rights that offer miners security and a longer-term perspective (Sinding, 2005). Property rights will stimulate investment in knowledge to minimize environmental risks and 'expanding existing mining areas creates incentives for miners to remain settled in their current locations, potentially limiting the ecological impacts of ASM to a particular zone' (Siegel and Veiga, 2009: 55).

However, the transaction costs of putting in place a formal system for ASM can be out of proportion with potential revenues it will create, as might be the case in Cameroon where total revenues are modest and the number of miners relatively large and difficult to monitor. Sinding (2005) suggested the possibility of leaving out the smallest operators from the formalization process for this very reason. But leaving them out of formalization also means that they stay out of sight and remain excluded from accessing rights and support. A rather light structure for these type of miners combined with easy accessible logistical services seems more appropriate.

Another element brought to the forth by this study is the element of trust. Trust between miners and local officials and vice versa is needed for any of the more formal mechanisms to function. Miners in TNS report harassments of government agents (mainly in CAR) and conservation agents (mainly in Cameroon). One advantage of having legal papers is shown in CAR, where a third of the miners solve their confrontation with agents by proving that they operate legally. Other encouraging signs of a positive atmosphere for formalization are that miners do propose 'having access to legal titles' as one of the solutions for improving their livelihoods. The main challenge is to construct a flexible type of formalization that accommodates the needs of miners, takes into account power structures and can be the operational arm of broader good sector governance.

Good sector governance in the context of TNS should encompass more than one sector. Integrated resource management on a landscape and regional, cross boundary level, can help to balance the positive and negative impacts of ASM. The current competing and contradicting stakes and authorities in the TNS landscape, shown among others in the overlap of ASM and LSM concessions, timber concessions and National Parks in TNS, increases the risk of degradation of the environmental values and exclusion of

less-represented groups who are the most dependent on these resources.

Although ASM has received more attention in global policy debates over the past decade and possible positive outcomes in terms of development have become increasingly recognized, the rights of ASM are being discussed in few international frameworks. CASM is the only platform that specifically deals with ASM, but again, Cameroon and CAR are not yet active participants. The EITI can enhance overall transparency of the sector but focuses on large-scale mining and is still in a planning phase for both countries. The Kimberley Process is interesting when it comes to the diamond sector monitoring in CAR but also implies a backward position for Cameroon, which is not a member (yet) and therefore unable to access the international diamond market of the KP member countries.

For Sub Sahara Africa, the African Mining Initiative and subsequent work of the multi-stakeholder initiative the ISG on mineral regimes offer important opportunities for discussing improved policies. ASM received a more significant place in these discussions over the past decades. Several regional initiatives have come into existence, among which the ECCAS call for harmonization of mining policies. Regarding the forest sector there are cross-boundary agreements about the natural services of the park. However, these TNS agreements are mainly conservation and forest exploitation based and they do not address mining activities. A regional integrated approach towards current issues in both the forest and mining sector would be highly recommendable and reinforce the outcomes of the TNS agreements.

Acknowledgments

This paper is based upon research recommended by 'Landscape and Livelihoods Strategy' (LLS) partners in TNS, and realized with the support and assistance of a team of enumerators, numerous local organizations and individuals from CEFAID-Cameroon, GTZ, WWF, the Ministry of Forests and Wildlife, the Federation of Miners, GIC/Mineur Boumba and local chiefs. We are grateful to all those involved, for devoting time and sharing expertise. The authors would also like to thank the reviewers for their constructive comments on earlier drafts of the manuscript.

References

- African Union, 2009. Africa Mining Vision. African Union, Addis Ababa.
- Armstrong, W., D'Souza, K., de, E., Pooter, 2008. Monitoring, formalisation and control of the artisanal alluvial diamond mining sector. In: Vlassenroot, K., van Bockstael, S. (Eds.), *Artisanal Diamond Mining: Perspectives and Challenges*, Academia Press, Gent, pp. 93–125.
- Babut, M., Sekyi, R., Rambaud, A., Potin-Gautier, A., Tellier, S., Bannerman, W., Beinhoff, C., 2003. Improving the environmental management of small-scale gold mining in Ghana: a case study of Dumasi. *Journal of Cleaner Production* 11 (2), 215–221.
- Barthélémy, F., Eberlé, J.M., Maldan, F., 2008. Transborder artisanal and small-scale mining zones in Central Africa: Some factors for promoting and supporting diamond mining. In: Vlassenroot, K., van Bockstael, S. (Eds.), *Artisanal Diamond Mining: Perspectives and Challenges*, Academia Press, Gent, pp. 20–40.
- Bijlsma, B., 2011. Governing Mining in Africa: African Perspectives, State Initiatives and International Standards. Niza/ActionAid, International Alliance on Natural Resources in Africa (IANRA), Amsterdam (p. 20).
- CAPAM, 2006. Creation du Capam. Retrieved 10 January 2010. Available at: < www.capam.site.voila.fr >.
- CAR, 2004. Ordonnance No. 04.001 Portant Code Minier de la République Centrafricaine. République Centrafricaine, Présidence de la République, Bangui.
- Carroll, R., 2008. The Congo Basin: Large-Scale Conservation in the Heart of Africa. WWF, Washington.
- CASM, 2010. Who is CASM. Retrieved 2 January 2010. Available at: < <http://www.artisanalmining.org> >.

- CBFP, 2006. The Forests of the Congo Basin, State of the Forest 2006. Congo Basin Forest Partnership.
- EITI, 2010. EITI Countries. Retrieved 3 January 2010. Available at: <<http://eitransparency.org/countries>>.
- Fisher, E., 2007. Occupying the margins: labour integration and social exclusion in artisanal mining in Tanzania. *Development and Change* 38 (4), 735–760.
- Haufler, V., 2009. The Kimberley Process Certification Scheme: an innovation in global governance and conflict prevention. *Journal of Business Ethics* 89, 403–416.
- Hentschel, T., Hruschka, F., Priester, M., 2002. Global Report on Artisanal and Small-Scale Mining. IIED, WBCSD, MMSD.
- Hilson, G., 2008. A load too heavy: critical reflections on the child labor problem in Africa's small-scale mining sector. *Children and Youth Services Review* 30 (11), 1233–1245.
- Hilson, G., 2009. Small-scale mining, poverty and economic development in sub-Saharan Africa: an overview. *Resources Policy* 34 (1–2), 1–5.
- Hilson, G., Potter, C., 2005. Structural adjustment and subsistence industry: artisanal gold mining in Ghana. *Development and Change* 36 (1), 103–131.
- Hilson, G., Pardie, S., 2006. Mercury: an agent of poverty in Ghana's small-scale gold-mining sector? *Resources Policy* 31 (2), 106–116.
- Hilson, G., Banchirigah, S.M., 2009. Are alternative livelihood projects alleviating poverty in mining communities? Experiences from Ghana. *Journal of Development Studies* 45 (2), 172–196.
- Hilson, G., Yakovleva, N., Banchirigah, M.S., 2007. To move or not to move: reflections on the resettlement of artisanal miners in the western region of Ghana. *African Affairs* 106 (424), 413–436.
- Hinton, J.J., Veiga, M.M., Veiga, A.T.C., 2003. Clean artisanal gold mining: a utopian approach? *Journal of Cleaner Production* 11 (2), 99–115.
- ILO, 2010. Convention No. C176: Safety and Health in Mines Convention, 1995. ILOLEX Database of International Labour Standards. Retrieved 4 January 2010. Available at: <<http://www.ilo.org/ilolex/english/convdisp1.htm>>.
- Kimberley Process, 2010. Annual Global Summary: 2009 Production, Imports, Exports and KPC Counts. Rough Diamond Statistics. Retrieved 19 October 2010. Available at: <<https://kimberleyprocessstatistics.org/static/pdfs/AnnualTables/2009GlobalSummary.pdf>>.
- Labonne, B., 1994. Small and Medium Scale Mining. Wiley Online Library.
- Le Billon, P., Nicholls, E., 2007. Ending 'resource wars': revenue sharing, economic sanction or military intervention. *International Peacekeeping* 14 (5), 613–632.
- Les Afriques, 2009. Uniformisation du code minier de la CEMAC, 22 September 2009. Les Afriques. Available at: <<http://www.lesafriques.com/afrique/uniformisation-du-code-minier-de-la-cemac.html?Itemid=64>>.
- Leach, M., Mearns, R., Scoones, I., 1999. Environmental entitlements: dynamics and institutions in community-based natural resource management. *World Development* 27 (2), 225–247.
- Maconachie, R., 2009. Diamonds, governance and 'local' development in post-conflict Sierra Leone: lessons for artisanal and small-scale mining in sub-Saharan Africa? *Resources Policy* 34 (1–2), 71–79.
- Newman, H.R., 2010. The Mineral Industries of Cameroon and Cape Verde. USGS 2009 Minerals Yearbook. Retrieved 19 September 2010. Available at: <<http://minerals.usgs.gov/minerals/pubs/country/2009/myb3-2009-cm-cv.pdf>>.
- Organization of African Unity, 1981. African (Banjul) charter on human and peoples' rights (Adopted 27 June 1981, OAU Doc. CAB/LEG/67/3 rev. 5, 21 I.L.M. 58 (1982), entered into force 21 October 1986). Eighteenth Assembly of Heads of State and Government, June 1981, Nairobi, Kenya.
- Paes, W., 2005. Conflict diamonds to "clean diamonds": the development of the Kimberley process certification scheme. *Resource Politics in Sub-Saharan Africa* 14, 305.
- Republic of Cameroon, 2001. Loi No. 001–2001du 16 Avril 2001 portant Code Minier de la République du Cameroun.
- Sale, C., 2006. Time for action. Editorial. *Information Review for the Promotion of Mining Activities in Cameroon (Bimonthly)*. Yaoundé, CAPAM: 3.
- Sandker, M., Campbell, B.M., Nzooh, T., Sunderland, V., Amougou, L.D., Sayer, J., 2009. Exploring the effectiveness of integrated conservation and development interventions in a Central African forest landscape. *Biodiversity and Conservation* 18 (11), 2875–2892.
- Shandro, J.A., Veiga, M.M., Chouinard, R., 2009. Reducing mercury pollution from artisanal gold mining in Munhena, Mozambique. *Journal of Cleaner Production* 17 (5), 525–532.
- Siegel, S., Veiga, M.M., 2009. Artisanal and small-scale mining as an extralegal economy: de Soto and the redefinition of 'formalization'. *Resources Policy* 34 (1–2), 51–56.
- Sinding, K., 2005. The dynamics of artisanal and small-scale mining reform. *Natural Resources Forum* 29 (3), 243–252.
- Tieguhong, J.C., Ingram, V., Schure, J., 2009. Study on Impacts of Artisanal Gold and Diamond Mining on Livelihoods and the Environment in the Sangha Tri-National Park (TNS) landscape. CIFOR, IUCN, Yaounde.
- Tschakert, P., 2009. Recognizing and nurturing artisanal mining as a viable livelihood. *Resources Policy* 34 (1–2), 24–31.
- UNDP, 2009. Global Urban Observatory and Statistics Universal Statistics Programme. Human Settlements Conditions and Trends. Cameroon. URL: <<http://www2.unhabitat.org/habrrdd/conditions/midafrica/cameroon.htm>>.
- UNECA, 2002. Yaoundé Vision Statement. In: *Proceedings of the Seminar on Artisanal and Small-Scale Mining in Africa: Identifying Best Practices and Building the Sustainable Livelihoods of Communities*, Yaoundé, Cameroon, 19–22 November 2002.
- UNESA, 2005. Plan of Implementation of the World Summit on Sustainable Development. Johannesburg, United Nations Department of Economic and Social Affairs: Division for Sustainable Development, 2010. Available at: <http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/POIToc.htm>.
- UNECA, 2010. International Study Group (ISG) to Review Africa's Mineral Regimes. Available at: <http://www.uneca.org/eca_resources/major_eca_websites/ISG/index.htm>.
- Vlassenroot, K., Bockstael van, S. (Eds.), 2008. *Artisanal Diamond Mining: Perspectives and Challenges*. Academia Press, Gent.
- Walle, M., Jennings, N., 2001. *Safety and Health in Small-Scale Surface Mines*. Working Paper (WP. 168). ILO, Geneva.
- Wiersum, K.F., 2009. Assessment of the Influence of Institutional Factors on Management Decisions by Small Farmers in the Amazon: Results of ForLive Working Programme 2. Forest and Nature Conservation Policy group, Wageningen.
- WWF, 2008. *Mining Concessions Over Forests and National Parks in Southeast Cameroon*. GIS Unit Jengi August 2008.