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# Local livelihoods, global interests and the state in the Congolese mining sector

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## 1. Mining and development: a disputed relationship

The relationship between mining and development is characterized by 'contentiousness' and 'ambiguity' (Bebbington et alii, 2008, p. 887): 'Contentious because mining has so often delivered adverse social, environmental and economic effects for the many, but significant gains only for the few; ambiguous because of the abiding sense […] that *just maybe* mining could contribute much more'. The most outspoken denouncers of these adverse effects on growth and equity are the advocates of the 'resource curse' thesis (Auty, 1993, Sachs and Warner, 1995). The thesis suggests that the abundant presence of natural resources generates a number of economic (mainly Dutch disease[1] and revenue volatility) and political effects (bad governance, corrupt institutions) which will eventually undermine a country's development.

Other authors have elaborated on this thesis by saying that the presence of (lootable[2]) natural resources (and the greed for these resources) is a cause of civil conflict (Collier and Hoeffler, 1998). Their model is based on utility theory: rebels will conduct a civil war if the perceived benefits outweigh the costs of rebellion. The theory has the merits of drawing attention to the importance of economic factors and the particularities of 'war economies' (Keen, 1998) which are 'parasitic', 'illicit' and 'predatory'. But the 'greed' argument has its limits and seems to be more convincing in explaining the duration of armed conflicts than the causes (Ballentine and Sherman, 2003, p. 267).

Despite the contentious contribution of mining to development, investments in the mining sector are still widely applied as a development strategy. The World Bank has encouraged investments in large-scale mining and mining legislation reforms. But they also point to the ambiguity of the relationship between mining and development (World Bank Oil, Gas and Mining Policy Division website). Due to the fact that globally more and more people are involved in artisanal and small-scale extraction, the Bank's attention has also diverted to these sectors. In 2001 the Bank created a Consultative Group for Artisanal and Small-Scale Mining (CASM), which would develop policy guidelines and implement projects. Yet attracting funding proved to be difficult, because 'this sector [artisanal and small-scale mining] is not recognized as an economic sector', as one of the participants at an evaluation round table in 2010 remarked (CASM website).

Still, artisanal and small-scale mining are extremely important in terms of production and in terms of securing local livelihoods. According to the International Labour Organization, artisanal and small-scale mines accounted for 15 to 20 per cent of the world's non-fuel mineral production in the beginning of the 21st century (Hentschel et alii, 2003, p. 19). By 'artisanal', we mean a non-mechanized, manual mode of production, which is highly labour-intensive, but does not require much capital investment. The difference between artisanal and small-scale is that the former may involve only individuals and families and is purely manual, while the latter is, to a certain extent, mechanized. 'Industrial' production on the other hand is both large-scale and mechanized. It does require a large capital, but a smaller labour force per

unit of production. The tension between large-scale and small-scale production modes (claims on the same land, often resulting in evictions or violent clashes) is present in mining sites all over the world. In the Democratic Republic of Congo (DRC), it is likely to become even fiercer in the coming years, as the country has now entered a 'post-conflict phase', after decades of economic crisis, state decline and violent conflict. Eastern DRC, which hosts large reserves of mineral resources, has been especially affected by violent conflicts. During the 'liberation war' in 1996-97, the AFDL coalition (*Alliance des Forces Démocratiques pour la Libération du Congo-Zaïre*) headed by Laurent Kabila and backed and steered by Rwanda, defeated the Mobutu regime. During the second war (1998–2003) or 'first African World War' (Reyntjens, 2009) several rebellion groups backed by Rwanda and Uganda fought against the Congolese regime. Some parts of Eastern Congo are still very insecure, but officially the war has ended and the post-conflict reconstruction has started.

In the next part of this chapter we assess the importance of Congo's mineral commodities (production and reserves) in global terms. We give a brief overview of the evolutions in production of the most important minerals, their role in national development and the key actors involved. In the third part we give a historical overview of the political economy of Congo's mining sector. We show how the sector has drifted between industrial and artisanal exploitation. The fourth part then questions the current coexistence of industrial and artisanal mining and the viability of artisanal mining as a livelihood. The different contributions in this book offer interesting perspectives to provide an answer to this question. They are broached in the conclusion.

## 2. Congo's minerals: their importance in globalization and national development

The DRC is often referred to as the classical example of the 'resource curse', but what exactly are Congo's mineral resources and what is their importance in global terms? It is true that the Congolese subsoil contains reserves of a wide range of rare and precious minerals. But only in the production of cobalt and diamonds, does Congo currently play a globally significant role (see Table 1).

Table 1. Global production of cobalt and industrial diamonds

| Cobalt | Share in global production | Diamonds (industrial) | Share in global production |
|---|---|---|---|
| DRC | 38% | DRC | 28% |
| Canada | 13% | Australia | 25% |
| Zambia | 12% | Russia | 20% |
| Russia | 10% | South Africa | 12% |
| Cuba | 6% | Botswana | 10% |

Source: Author's table based on USGS, 2009

### 2.1. Copper and cobalt

The southern province of Katanga hosts a large part of the 'Central African Copperbelt', stretching from Angola to Zambia and containing over 10 per cent of the world's copper and 49 per cent of the cobalt reserves (five million tons of cobalt) (USGS, 2009a). The copper reserves are very important and of high quality, but the Congolese copper production is currently of minor importance on the world scale, although over the past two years there has been a considerable rise in production capacity (USGS, 2009c).[3] The Katangese cobalt

production is, however, significant on a world scale (see Table 1). Cobalt is produced as a by-product of copper, but also as a primary product.

Industrial copper and cobalt production started in Katanga at the beginning of the 20th century by the Union Minière du Haut-Katanga (UMHK). UMHK's successor Gécamines (a state-owned company, created after the nationalization in 1967) ranked among the world's top five producers of copper and cobalt until the mid-1980s, with an annual production of about 400,000 to 500,000 metric tons of copper and 16,000 tons of cobalt. During the period 1968–1974, Gécamines also accounted for about 70 per cent of state revenues (Bezy et al, 1981, p.83), but in 1975 copper prices fell dramatically. The demand for cobalt, however, remained high and prices even boomed in 1975–1980. From 1979 on, copper prices also recovered (Bezy et al, p. 187). In 1982 Gécamines again recorded a peak production of 542,600 metric tons of copper. From the late 1980s on however, production of both copper and cobalt steeply declined. It fell to 200,000 metric tons of copper at the beginning of the 1990s and even below 30,000 metric tons in 1994 (see Figures 1 and 2). At this time Gécamines was facing bankruptcy.

INSERT FIGURE 1

INSERT FIGURE 2

When the 1998–2003 war finally came to an end, the international climate was again favourable for investments in industrial copper and cobalt production. The rising global demand (especially in emerging economies like China and India) and resulting booming prices caused a veritable 'metal mania'. This incited international mining companies to start new projects in the DRC and to conclude a number of joint venture contracts with Gécamines (for example Tenke Fungurume, Anvil Mining, First Quantum (World Bank, 2008, p. 107)). In 2008 there were 325 mining companies active in Katanga, of which 10 were traded on international stock exchanges (ibid, p. 14). Moreover, the metal mania pulled thousands of unemployed Congolese to the mines. There would be an estimated 50,000 to 150,000 miners (NiZA, 2006 p.9, KFW, 2007, p. 28, De Koning, 2009, p.7) digging for 'heterogenite' (an ore consisting of 25 per cent copper and 10 per cent cobalt).

In comparison to the 1990s, the production of cobalt increased to about 14,500 tons in 2006, which represented 25 per cent of global production (KFW, 2007, p. 29). In 2007, Congo's share of global cobalt production rose to 38 per cent (see Table 1. USGS, 2009a). Cobalt (in the form of raw ore, since processing plants and refineries have been abandoned since the 1990s) is mainly exported to China, the world's leading producer of refined cobalt (USGS, 2009b). Unfortunately the global economic crisis heavily impacted on the mining sector in Katanga (Cuvelier, 2009). Many industrial companies, which were waiting for the results of the review of the mining contracts and often starting up their activities, closed down again. Among artisanal miners, the crisis caused high levels of unemployment and resulting social tensions.

### 2.2. Diamonds

Diamonds are located in Western and Eastern Kasai, and also in the north-eastern province of Orientale. These regions are believed to hold almost one-quarter of the world's diamond reserves in terms of carats (150 million carats (World Bank, 2008, p. 15])). In the beginning of the 20th century the Belgian company Forminière (Société Internationale Forestière et

Minière du Congo) started alluvial mining in the Tshikapa area in Western Kasai. In 1960 Forminière was replaced by Miba (Minière de Bakwanga), in which the state held 80 per cent of the shares. Miba production was concentrated in Western and Eastern Kasai. As can be seen in Figure 3, industrial production decreased from the late 1970s onwards. In 1982 artisanal production was 'liberalized' by Mobutu, which attracted thousands of diggers to the diamond mines. Since this moment, annual artisanal production has systematically exceeded industrial production. Currently about 90 per cent of Congolese diamonds is artisanally extracted by an estimated 700,000 to one million diggers in Kasai (World Bank, 2008, p. 57).

It must also be noted that on average, the value per unit of the artisanally mined stones is higher than those extracted industrially. The artisanal deposits (mostly alluvial) contain more gemstones than the deposits which are exploited by Miba[4] (ibid, p. 116). Still in general, both industrial and artisanal production mainly consists of diamonds for industrial applications (65 to 75 per cent), rather than gemstones. For industrial diamonds, the DRC is the world's top producer. In 2007 its production amounted to 28 per cent of total world production (USGS, 2009a). Congo's share in the global gemstone production however was at 6 per cent in 2007. Here the leading countries are Botswana (28 per cent), Russia (25 per cent) and Canada (19 per cent).

INSERT FIGURE 3

### 2.3. Coltan

Congo's eastern provinces host a number of rare mineral deposits, such as coltan. Coltan is an abbreviation for columbite-tantalite, a mineral from which the metals tantalum and colombium (also known as niobium) are extracted. In the beginning of the 21st century, the growing demand from the electronic industries (especially mobile phones) caused a 'coltan boom' in Eastern DRC and attracted thousands of miners and small traders. In 2000 the official exports mounted to 560 metric tons (KFW, 2007, p. 31). But the coltan boom did not last. In January 2001 coltan prices began to fall, reaching less than a third of their peak in October 2001. This was due to a decline and a subsequent stagnation in the global demand for electronic components (Pole Institute, 2002).

In 2007 Congo occupied fifth place of coltan producers with a total (official) production of 120 metric tons of columbite-tantalite (the world's total production was 262,000 metric tons gross mass, of which 60,400 tons niobium content and 815 tons tantalum content (USGS, 2009e)). However, much of the Congolese production is traded in unofficial trading houses and is therefore unrecorded, or it is under-declared at the border posts. It is, therefore, extremely difficult to give an estimation of the real coltan production. However, it is known that Congo's tantalum reserves have a strategic importance. The eastern provinces are estimated to host 25 to 65 per cent of global reserves (KFW, 2007, p.26)).

### 2.4. Tin (cassiterite)

During colonial times, tin was produced by MGL (Minière des Grands Lacs) in North and South Kivu. In the 1940s, Congo was the second biggest tin producer in the world (after Bolivia (KFW, 2007, p. 31])). In 1976 nine mining companies merged in the newly created Sominki (Société Minière et Industrielle du Kivu), in which the state held 28 per cent and private shareholders (mostly Belgian) 72 per cent. When Sominki closed down in 1996 the entire cassiterite (tin ore SnO2) production became artisanal. Artisanal miners have since then

continuously produced cassiterite in North-Kivu (Bisie in Walikale territory being the most important in terms of production), Maniema (Kasese and Kalima), South-Kivu and Katanga (Garrett, 2008, p.30-31).

During the coltan boom, cassiterite was considered as a mere rest product of coltan. But in recent years the tin price has risen again, and production increased. Global tin production was 320,000 metric tons in 2007 (USGS, 2009), leading production countries being China, Indonesia, Peru, Bolivia and Brazil. DRC is a small actor in this market. During the first six months of 2007, recorded exports of cassiterite from North-Kivu were 4,019 tons, compared to 2,904 tons for 2006 and 3,599 tons for 2005. In South-Kivu, reported exports were 2,974 tons in 2006 compared to 3,149 tons in 2005. However, this seems to be an underestimation, since production is largely artisanal and not always recorded.

### 2.5. Gold

In the Ituri region, industrial gold extraction started in 1926 by a Belgian company, Société des Mines d'Or de Kilo-Moto. In 1966, activities were taken over by Okimo (Office des Mines d'Or de Kilo-Moto), a 100 per cent state-owned enterprise. Until 1974, production levels were at about three to four tons per year. From then on, it declined to 500 kilograms-1 ton in the 1980s (World Bank, 2008, p. 120). In 1996 Ashanti Goldfields acquired the mining rights for the Mongbwalu area. They did not start exploration until after the 1998–2003 war.

In South Kivu and Maniema, gold was first exploited by MGL and later by its successor Sominki (which mainly extracted cassiterite). This company produced between 450 and 650 kilograms in the 1980s, which fell down to 300–400 kilograms in the 1990s. At the start of the liberation war in 1996, Sominki closed down and sold its titles to the Canadian Banro Resources Corporation.

Since 1996, the industrial gold production has been close to zero. Artisanal production however is currently much higher than the former Okimo and Sominki production. An estimated 5,200 kilograms per year are exported from the Ituri and Haut-Uélé districts in Orientale Province, while those from South-Kivu would be around 4,800 kilograms per year (USGS, 2009d). The estimated production is thus about 10 tons annually. These represent only a tiny percentage of global exports (total production of 2,340 tons per year, USGS, 2009d). Actually the estimated figure of 10 tons is based on exports from neighbouring countries and import figures, since more than 80 per cent of gold production leaves the country through unofficial commercial networks, outside of governmental regulation or control. From Orientale Province, much gold is smuggled to Uganda (Kampala), whereas from South-Kivu, the gold usually transits through Burundi (Bujumbura) or Tanzania.

Both in Ituri and in South Kivu, mining companies are currently exploring and setting up new projects (see also Dan Fahey and Sara Geenen in this volume). Banro holds the titles to four gold sites in South Kivu and Maniema (Twangiza, Namoya, Luguhwa and Kamituga). The company has planned to produce an average of 8,100 kilograms per year during the 13-year life of the mine in Twangiza (after 13 years, the reserves will be depleted according to their estimations) and an average of 5100 kilograms per year during the eight-year life of the Namoya mine (Banro website). In Ituri, Ashanti Goldfields Kilo (AGK, joint venture of Okimo and AngloGold Ashanti) conducted exploratory drillings in Concession 40 in and around Mongbwalu.

### 2.6. Other reserves

Apart from cobalt, copper, diamonds, coltan, cassiterite and gold, the Congolese underground holds many other rare and possibly strategic minerals. In Katanga one can find zinc, silver, germanium and uranium deposits. The Shinkolobwe uranium mine is now closed for industrial production. However the uranium reserves remain attractive for artisanal exploiters (World Bank, 2008, p. 15). In the Eastern provinces there is tungsten and wolframite. There is methane gas in the Kivu Lake and oil in Lake Albert. An estimation of the reserves can be found in Table 2.

**Table 2. Mineral reserves in DRC**

| Mineral | Part in global reserves (%) | Possible reserves (in tons) | Potential value (average 2005 prices) (in billions of USD) |
|---|---|---|---|
| Diamonds | 25 | > 500 Millions of carats | > 17 |
| Copper | 6 | 70,000,000 | 130 |
| Cobalt | 34 | 5,000,000 | 90 |
| Gold | > 1 | 500 | 34 |
| Tantalum | 25-65 | 200,000 | 15 |
| Zinc | 3 | 6,000,000 | 4 |
| Tin | 7 | 800,000 | 2 |
| Germanium | ? | < 300,000 | ? |

Source: KFW, 2007, p. 26

## 3. Congo's political economy: drifting between industrial and artisanal mining

In the Congo case, all elements of a resource curse seem to materialize: abundant presence of mineral resources, poor governance, economic decline and civil war. Throughout its history, the mining sector has played an important role in Congo's economy, and is closely linked with the broader political economy of Zaire and Congo.

Industrial exploitation of mineral resources started in the 1920s and rapidly expanded, thanks to the growing demand for primary commodities on the world market and the increasing interests of Belgian investors. The large state-owned mining companies quickly worked towards a capitalistic intensification of the production process and a 'stabilisation of manpower' (Bezy et al, 1981, p.27) by providing some basic infrastructural and social services to their workers, their dependents and the community at large. Apart from housing for workers and families and access to electricity and water, they also provided schooling, healthcare and recreational facilities. Gradually, all aspects of the worker's life came to be controlled by the mining companies. This meant a crucial step in the colonial system and a significant change in the lives of many Congolese.

The heavy exploitation of mineral resources during the colonial era slowly declined after 1960. The Belgians granted Congo political independence, but retained economic power through control of key industrial mining operations. Western interventions and Congo's internal politics combined to produce a period of instability from 1960–1965, which ended when Western governments helped Mobutu Sese Seko to take power in a coup. Mobutu sought to centralize political and economic power in the Congolese government and

nationalize the most important companies, but this had disastrous effects on Congo's economy and mineral production.

The 1973 Zairianization measures nationalized all companies, plantations and other businesses owned by foreigners. In the mining sector, Zairianization measures mainly targeted the regime's 'cash cows' in the copper and cobalt sector and some large gold and diamond producers.[5] However, the new owners and managers, all connected to Mobutu's patrimonial network, were ill-prepared for their tasks. Due to bad management and bad maintenance of the infrastructure, industrial production dwindled. The only sector where industrial production levels were still increasing was copper. Yet in 1975, copper prices fell dramatically on the world market. This had a heavy impact, not only on the copper sector, but on the entire Zairian economy, since the state was heavily reliant on copper exports for its foreign exchange earnings.

One of the measures taken by Mobutu to counter the negative impact of the Zairanization measures was to alleviate the state's control on the exploitation of mineral resources, hence the law on the 'liberalization of the exploitation and trade in precious minerals' (gold and diamonds) in 1982.[6] These measures were presented as a way for Congolese nationals to benefit more from the enormous potentials their country held. The new law allowed all Congolese citizens to possess and transport diamonds, gold and other precious stones. Besides, they could apply for mining and export licences. The law further specified that all exploiting actors and exporting companies had to be registered, so as to guarantee some control over the sector, and to redirect the trade through official circuits.

The new law provoked an influx of artisanal diggers and traders to the mining sites. Also, the total output of the mining sector started to increase again. While in 1982, artisanal diamond production accounted for almost one million carats, in 1983, it had already increased to almost six million carats, and in 1986 to 14 million carats (Dietrich, 2002, p.6). By assessing export figures in 1983 and 1984, Tshibanza and Tshimanga (1985) conclude that the liberalization measures had a short-term positive effect on official export figures and state revenues. However, the authors warned of an increase in smuggling and the presence of 'pirate-comptoirs', especially in the East. The latter were able to offer better prices and had better access to financial resources than the officially registered 'comptoirs'. As a result, the Eastern Provinces came to be entirely oriented towards the neighbouring countries, especially Burundi and Kenya, where minerals coming from Congo were smuggled and exported to the world market by Lebanese, Indo-Pakistani and national traders.

It was clear that in the 1980s, Mobutu's policies had produced a structural economic and financial crisis. Despite liberalization and stabilization measures and a structural adjustment programme, Zaire's financial situation did not improve. In the early 1990s, the country increasingly fell into the grip of hyperinflation, currency depreciation, a deteriorating infrastructure, and declining productivity. Besides, foreign aid completely dried up. By the mid-1990s, the national government's budget came to be almost entirely dependent on revenues from diamond exports.

The 'informalization' of mining activities continued during the 1990s, and was considerably reinforced during the war periods (1996–97 and 1998–2003). After the 'liberation war' (September 1996 until May 1997), the Kabila regime wanted to reform the mining sector and make it more independent from major Anglo-American companies (Kennes, 2002, p.163). Several contracts that were concluded just before the war, were renegotiated and agreements

for provisional exploration activities were granted to international companies. But the government found itself in a weak negotiation position, as it needed funds quickly and was vulnerable to concluding unbalanced agreements that were favourable to the mining companies and government officials rather than to the Congolese state. At the same time the new regime was trying to replace the former politico-commercial networks (local politicians and businessmen loyal to Mobutu) with their own. This resulted in conflicting tendencies of reconstruction and criminalization (Kennes, 2005). On the one hand, foreign companies proved to be eager to invest in the country and concluded many exploration and exploitation agreements. On the other hand, new rent-seeking networks were formed around the new government, so that the benefits of these agreements continued to flow to the politico-military elites, instead of to the Congolese population.

In the course of the 1990s, as a result of a military coup, international sanctions and a civil war in Burundi, the mineral flows were also redirected towards Kampala. During the second Congo war (1998–2003), Uganda and Rwanda reinforced their role as transit countries and were directly involved in the plundering of Congo's resources. Existing politico-commercial networks inside the DRC linked up with armed groups and with external financiers. This further enhanced the criminalization of the mining sector. The control over exploitation sites and trade routes became an incentive and a means to finance the war for Congolese rebel groups, the Congolese national army and for the neighbouring countries. For this reason the conflict came to be considered as a purely mineral resources-driven conflict, which even reinforced the case of presenting the DRC as the example of the resource curse. However, several authors have demonstrated that the greed for natural resources was a symptom of the war, rather than its cause, and that economic interests were inseparable from political interests.[7]

After 2003, some companies that had signed contracts in the 1990s resumed their activities[8]. On the other hand many newcomers were attracted by the enormous potentials in the country and sought to sign joint venture contracts. For most commodities production shows an upward trend after 2003. But the Congolese economy remains extremely extraverted and vulnerable to external shocks. This became clear in 2008–2009, when the international financial crisis heavily impacted on the national economy, and on the Katangese mining sector in particular.

A possible turning point in the history of Congolese mining was the conclusion of a cooperation agreement between the DRC and a group of Chinese enterprises. Much needed infrastructure works will be carried out in exchange for guaranteed access to copper and cobalt reserves (see Marysse and Geenen's contribution in this book). This agreement confirms the renewed interest of large-scale actors in the Congolese mining sector. However as we have said, this sector is currently dominated by artisanal mining. In the next section we therefore reflect upon the probable competition and the possible coexistence between industrial and artisanal production modes in mining.

## 4. Industrial and artisanal mining: coexistence, limits and opportunities

Let us first of all have a look at the official legal framework. In 2002, the Kabila administration adopted a new Mining Law[9], which was established under the guidance of the World Bank and the International Monetary Fund (IMF). The Law and the subsequent Mining Regulations[10] provide the legal framework for acquiring mining titles and trade permits. This formal framework differentiates between three modes of production, subject to different tax regimes and permit systems: industrial mining, small-scale mining and artisanal mining (see

section 1). The influence of the international financial institutions in the new Mining Law is obvious in the primacy of private sector development and the priority of large-scale projects. Whereas the sector was previously dominated by public enterprises, the aim now is to attract private investments in exploration and exploitation. In this context, the Congolese government should adopt the role of a regulator instead of an operator (through the state-owned mining enterprises). The Mining Law contains more provisions for large-scale and industrial mining than for artisanal and small-scale mining or ASM.

Yet the most important future challenge is the coexistence of artisanal and industrial mining. In mining areas all over the world, concessions are being contested by small-scale and large-scale actors. Sometimes this results in violent confrontations between artisanal miners and private or state security forces. The large-scale actors perceive the diggers as threats, whereas local diggers often react to physical relocation, dispossession of land and degradation of the community's resources (Ballard and Banks, 2003, p. 299). These contestations are usually rooted in divergent views on land ownership. On the one hand, large-scale actors insist on the fact that they have legally acquired concessions and titles. Small-scale actors on the other hand assert that they have the traditional right to work the land (Hilson, 2002, Bush, 2009). This way, the former adhere to state law (their titles have been officially registered), while the latter base themselves on customary traditions and traditional law. Both are trying to secure their titles, but small-scale actors often find out that the non-state norms they are adhering to clash with state regulations.

The tensions and open conflicts between large-scale and small-scale actors in mining are frequently portrayed as battles between David and Goliath. Artisanal diggers are said to 'invade' concessions, whereas industrial companies are 'wiping away' the diggers. Diggers are either portrayed as victims of the destructive forces of global capital, or as resistance fighters protecting their traditional land rights. While in many cases diggers are indeed in a weak bargaining position, it is important to acknowledge that industrial and artisanal exploitation do not always and should not, in principle, clash. The reason is that industrial and artisanal production modes have very different logics.

There are, for example, technical limits to artisanal exploitation methods. The deeper one digs, the more difficult it becomes to evacuate large volumes. When a mining pit reaches more than 40 metres in depth, it is dangerous, and according to Congolese law prohibited, to continue artisanal exploitation. Moreover, investments are needed in order to avoid collapsing tunnels, to evacuate the groundwater and to circulate oxygen. Other sites cannot be exploited in an artisanal way because the minerals are very finely dispersed in the rocks, so that one needs to use chemical methods (mercury) in order to extract the gold. In this case, industrial production techniques are needed. Industrial methods are also more profitable in deposits where the mineral substances are dispersed over a larger area and where large volumes of stones have to be extracted. But industrial production requires a lot of investment and mechanisation. Therefore, each possible mining project is carefully judged on its feasibility and profitability. The feasibility of a particular mining project depends upon a range of factors: available reserves, volume of stones to be extracted, distance of the mining site from transport routes, necessary treatment of minerals, need for a processing factory and so on.

When an industrial mining project is judged not profitable for large-scale actors because of implementation time and initial investment costs, it can be suitable for small-scale or artisanal mining. Artisanal miners usually work in teams of five to 10 or 50 fifty diggers, who are each responsible for a specific phase in the production process (see also Fahey's and Geenen's

contributions in this volume). They use simple tools for extracting and processing the stones. All these processes are extremely labour-intensive and working conditions are often difficult. But some deposits are difficult to access and thus better suited to labour- intensive methods. Sometimes artisanal miners also exploit superior, high-grade layers, leaving the inferior, lower-grade layers for possible industrial companies. This process of exploiting superior layers is called 'écrémage' (skimming) in the Congolese context.

As Stewart (1989, p.48) summarizes: 'large low-grade deposits are ideally suited to capital-intensive methods while small high-grade deposits are ideally suited to labour-intensive methods'. The type of deposit, to a great extent, determines the type of activity (IMF, 2005, p.46). At this point, however, industrial and artisanal mining in Congo compete with each other rather than coexisting next to each other. This is at least partly due to a lack of clarity at the legal level. The Mining Law, for example, does not specify how competing claims between industrial and artisanal actors to the same site can be resolved, or how exactly the existence of artisanal mining in industrial mining areas should be dealt with. One provision that is included in the Law is the demarcation of special zones designated for artisanal mining. But until now, few artisanal mining zones have been created: in the two Kasais there are none, in South Kivu two and in North Kivu seven. In Katanga, 150,000 miners were supposed to occupy six zones that were established in 2005. 'But five of the zones had closed one year later due to economic and technical difficulties. The one zone presently operating is too small a surface area to accommodate the miners and, in any event, the zones are some distance from urban centers and transport infrastructure' (World Bank, 2008, p. 61).

The lack of attention for artisanal mining is remarkable, given the fact that it is the most important production mode and source of employment at the moment. It is estimated that 90 per cent of mineral production in DRC comes from artisanal miners. Estimates on the number of diggers in the county vary from 500,000 to two million (World Bank, 2008, p. 56). According to Pact Congo (2008, p. 10-11), there would be about one million diggers in Eastern and Western Kasai, 150,00 in Katanga, 20,000 in South-Kivu and Maniema and another 200,000 in North-Kivu and the Province Orientale respectively.

While so few areas have been designated for artisanal mining, a large part of the national territory has been carved up for industrial exploitation. The World Bank (2008, p. 17) presents figures as of September 2007: 4353 exploration permits have been granted, 471 exploitation permits, 59 small-scale permits and 476 other permits/authorizations. Private companies hold 4246 of these exploration permits and 166 of the exploitation permits without any agreement with the state. An important problem is that many of the exploration permits are held for speculation rather than for serious exploration work (World Bank, 2008, p. 22). It is also important to note that the small-scale (but mechanized) sector is not strong. This is due to the limited investments opportunities and tenure insecurity for small-scale permit holders.

The existence of large concessions holds a constant threat of forced removals, as we have already witnessed in Katanga and in Kasai (World Bank, 2008, p. 57-58). Since artisanal miners and their families often entirely depend on mining for their livelihoods, they are unwilling to move from the sites they occupy. Besides, the average income for a miner is significantly higher than the revenues they may get from other activities, so reintegrating these miners in other livelihoods is difficult. According to the World Bank (2008, p. 47): 'conflicts between artisanal and industrial producers are the Achilles heel which jeopardizes the future of mining in Congo'.

At this point, an important question to consider is whether artisanal and small-scale mining offer opportunities for development. In the literature there seems to be a consensus that, in spite of some negative social (children abandoning school), health (use of mercury) and environmental (erosion and reduced soil fertility) consequences, it does. First, since artisanal mining is mobile, flexible and requires little capital, it allows the mining of resources that would otherwise not be profitable. The flexibility of informal work can also be a response to the peaks in world demand for commodities (see Marysse, 1997). Second, artisanal mining creates rural employment and thus might halt rural-urban migration. Third, small-scale projects are often owned by local entrepreneurs and could through their local embeddedness contribute to local development. It also creates opportunities for small-scale enterprises in the local communities. Furthermore, artisanal mining: 'is complementary to existing social structures in developing countries. For example, it is often seasonal, which fits well with agriculture in certain areas' (Andrew, 2002, p. 118, see also Hilson and Yakovelva, 2007, p.115). Finally, several authors have also emphasized the possible contributions of small-scale mining to national development through the creation of employment, taxes and foreign exchange earnings.

## 5. Conclusion: livelihoods of artisanal miners and global interests in Congo

In the DRC, mineral large-scale and small-scale mining have long been considered as contributing to conflict and underdevelopment, rather than to development. However, the mining sector offers a range of opportunities at different levels. At the level of the national economy, the mining sector has always played an important role. If well governed, it can generate a lot of revenue for the Congolese state. At the level of individual livelihoods, (artisanal) mining also offers a range of opportunities.

Since the Congolese economy is extremely extraverted, it heavily depends on evolutions at the international level. When the prices of raw commodities are booming, many international and local actors become interested in mining. When prices fall, this has a direct impact in Congo. In any case the current post-conflict context seems to be increasingly attractive for international investors. Multinational companies are showing their interest, as well as a group of Chinese state-owned enterprises. All this could possibly have very positive impacts on Congo's development.

However, 'virtually all mining areas of the DRC face the challenge of balancing artisanal and small-scale mining activities with the growing presence of large scale mining' (CASM, 2007, p.18). Tensions and conflicts over mining sites are rampant, as industrial companies consider artisanal miners as intruders on their territory, whereas artisanal diggers view the granting of concessions as depriving them of their traditional rights to land and livelihoods. We argue that industrial and artisanal production modes can coexist and that certain initiatives can help to protect and improve the livelihoods of artisanal miners. First of all, an artisan's tenure security may be improved by the creation of artisanal mining zones. Secondly, artisanal miners' cooperatives should be recognized and they should be able to obtain a small-scale mining permit. They should also be able to receive technical assistance and thus enhance their productivity

Three case-studies in this book illustrate how large-scale and small-scale actors interact, and how livelihoods of small-scale actors are influenced by events and evolutions at a larger scale.

Dan Fahey describes the livelihood of artisanal mining in the Ituri district, and assesses how it will be affected by planned industrial mining operations. He draws some cautionary lessons for other parts of Congo and Africa where artisanal and industrial mining interests collide. The Congolese state has so far been incapable of overseeing the resumption of industrial mining and the formalization of artisanal mining and the gold trade. It is currently too weak and too focused on rent seeking to work with civil society and industry to create a new structure that accommodates artisanal and industrial production.

Drawing on a very specific case-study in South-Kivu, Sara Geenen describes the actors and the multiplicity of practical norms involved in gold exploitation and trade. She argues that diggers and small traders – often portrayed as the victims of greedy multinationals or armed groups – exercise agency, while being constrained by a number of practical norms that govern their activities. With the imminent presence of industrial actors on the scene, challenges are arising, but there are also opportunities for small-scale actors.

In his chapter Jeroen Cuvelier makes two arguments about domination and resistance in the Katangese mining sector. Using two different case-studies he shows that the state's management of the mining sector is guided by a rationality of 'controlled sovereignty' and a rationality of 'paternalism'. On the other hand he contends that, as a result of the fluidity of power relations in the mining sector, artisanal miners sometimes receive opportunities to publicly voice 'hidden transcripts' aimed at criticizing the state's abuses.

A fourth case-study looks into the challenges and opportunities presented by the 'cooperation agreements' on the exploitation of mineral resources concluded between the Congolese government and a group of Chinese state-owned enterprises. These enterprises will step into a joint venture with Gécamines to get access to copper and cobalt reserves. The contribution by Stefaan Marysse and Sara Geenen aims at analyzing these agreements and at assessing their likely impact on Congo's development. It demonstrates the renewed interest of large-scale actors and the way the Congolese state and the international community deal with this.

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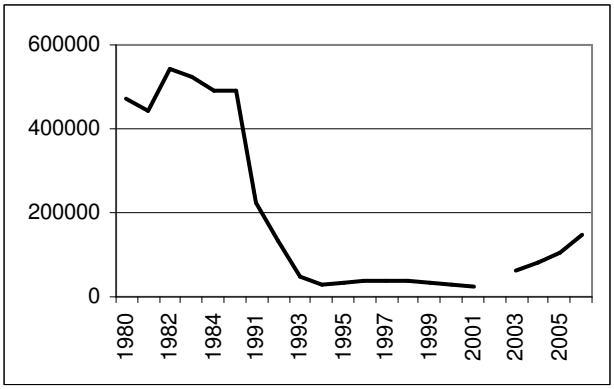
**Tables and figures**

**Table 1. Global production of cobalt and industrial diamonds**

| Cobalt | Share in global production | Diamonds (industrial) | Share in global production |
|---|---|---|---|
| DRC | 38% | DRC | 28% |
| Canada | 13% | Australia | 25% |
| Zambia | 12% | Russia | 20% |
| Russia | 10% | South Africa | 12% |
| Cuba | 6% | Botswana | 10% |

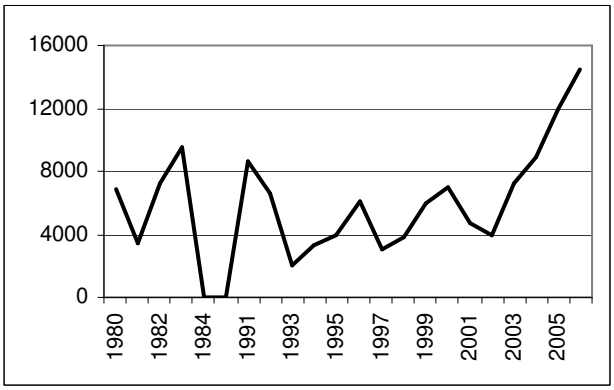
Source: Author's table based on USGS, 2009

**Figure 1. Gécamines copper production**



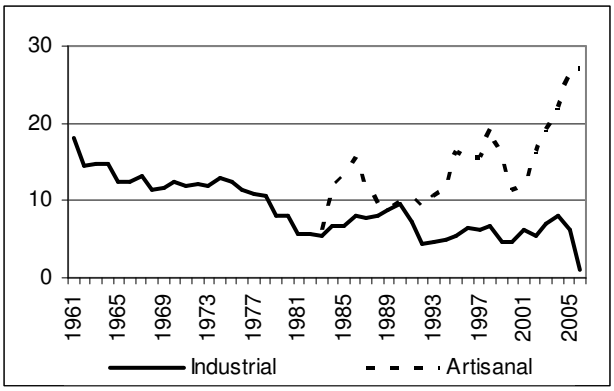

Source: World Bank, 2008, p. 103 and KFW, 2007, p. 29

**Figure 2. Gécamines cobalt production**




Source: World Bank, 2008, p. 103 and KFW, 2007, p. 29

**Figure 3. Artisanal and industrial (Miba) diamond production (in millions of carats)**




Source: World Bank (2008) and Banque Centrale du Congo (BCC)

**Table 2. Mineral reserves in DRC**

| Mineral | Part in global reserves (%) | Possible reserves (in tons) | Potential value (average 2005 prices) (in billions of USD) |
|---|---|---|---|
| Diamonds | 25 | > 500 Millions of carats | > 17 |
| Copper | 6 | 70,000,000 | 130 |
| Cobalt | 34 | 5,000,000 | 90 |
| Gold | > 1 | 500 | 34 |
| Tantalum | 25-65 | 200,000 | 15 |
| Zinc | 3 | 6,000,000 | 4 |
| Tin | 7 | 800,000 | 2 |
| Germanium | ? | < 300,000 | ? |

Source: KFW, 2007, p. 26

[1] Dutch disease is an economic phenomenon in which the revenues from natural resource exports cause an increase of the real exchange rate and a wage increase, which makes tradable sectors less competitive in the world market. This will in return lead to a greater dependence on natural resources and hence a greater vulnerability to price changes.

[2] See Le Billon (2001, p. 569): 'The *lootability* arises in part from the fact that resources […] are often easily accessible to governments and rebels alike with minimal bureaucratic infrastructure. Furthermore, resource extraction activities are, to a greater degree than other economic activities, spatially fixed.'

[3] 'With some 70 million tons (Mt) of reserves, the Democratic Republic of Congo (DRC) comes second after Chile (88 Mt)'. But the Copperbelt reserves hold higher copper grades and are thus of better quality than the Chilean reserves (Custers and Matthysen, 2009, p.28).

[4] The artisanally mined deposits contain 20 per cent of gemstones, or high value stones used for jewellery. The deposits exploited by Miba contain only 5 per cent gemstones. The rest are raw diamonds used for industrial applications.

[5] Zairianization measures targeted among others Gécamines, Miba and Okimo. The gold and cassiterite sector in the Kivus however to a large extent escaped Zairianization measures.

[6] Promulgated on 5 November 1982 and 1 December 1982.

[7] This has recently been argued by Lemarchand (2009) and Prunier (2009) and follows a broader argument put forward by Cramer (2002) and Ballentine and Sherman (2003) among others.

[8] During the 1995–2000 period some important contracts were signed. Gecamines concluded an agreement with the Lundin group for the development of the Tenke Fungurume copper deposit. Gécamines also signed a contract with the Forrest-Outokumpo group (GTL-STL) and with Anvil Mining (Australia). Furthermore, Okimo concluded agreements with Mindev and Barrick. Sominki entered into a partnership with Banro Resources for the development of gold deposits. Finally MIBA signed an agreement with Senegamines for diamond exploitation.

[9] Loi n° 007/2002 du 11 juillet 2002 portant Code Minier (Mining Law).

[10] Décret n° 038/2003 du 26 mars 2003 portant Règlement Minier (Mining Regulations).