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Coltan, Congo & Conflict

The Hague Centre for Strategic Studies (HCSS)

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Executive Summary

In the early 2000s, tantalum – a rare metal with some unique properties that make it an important raw material for information and communication technologies – suddenly moved from obscure geological publications into a wide public spotlight. Effective NGO campaigns using catchy slogans, such as ‘No blood on my mobile’, emphasized that consumer demand in the West for mobile phones, computers, game consoles and other electronic devices, all of which contain small amounts of tantalum, fueled mass atrocities in the Democratic Republic of Congo (DRC).

The strong public attention on tantalum and coltan is somewhat puzzling. Coltan is far from being the most important mineral that is mined in the DRC, and the DRC has never been the main tantalum supplier to the global market. This report therefore seeks to redress the largely mediatic coverage of the role of coltan mining in the DRC conflict, contributing to a more informed analysis of the relationship between the two.

The report was prepared as part of the POLINARES project, which aims to examine the main global challenges surrounding access to fossil fuels and mineral resources. First, it provides the main facts and data on tantalum, such as its properties and uses, the supply chain from mine to metal, and price developments. Next, the report gives a short historic overview of conflict in the DRC which is followed by an overview of coltan and tantalum resources and coltan mining in the country. Then, the report focuses on the specific role of coltan in the present conflict in the DRC. It analyzes the involvement of armed groups in the mining and mineral trade and touches upon the debate on greed and grievances when assessing the motivations of armed groups. Finally, the report gives an overview of the policy measures that were adopted or proposed to mitigate the negative effects of coltan mining and trade on the conflict in the DRC, and analyzes their effectiveness and efficiency.

The report concludes that the importance of coltan as a source of revenue for armed groups is often exaggerated. With the exception of a short-lived coltan boom in 2000-2001, it was never a substantial source of funding for armed groups. Although armed groups have profited from the DRC's mineral wealth, coltan was not the main instigator of the conflict in the DRC and was at most a contributing factor.

Many policy initiatives aimed at breaking the link between mining, mineral trade and conflict, including Section 1502 of the Dodd-Frank Act in the U.S., suffer from problems related to both effectiveness and efficiency. First of all, there is little convincing evidence that initiatives focusing on limiting the mineral revenue of armed groups are likely to lead to a significant reduction of violence in the DRC. We believe this is because many conflict mineral policy initiatives assume that mineral revenues are the main reason behind the continued fighting in eastern DRC. However, reducing the mineral revenue of armed groups primarily addresses symptoms of a deeper problem. As long as the underlying reasons for conflict continue to exist and the right governance structures to address grievances are lacking, rebels will simply shift from trade in minerals to other sources of revenue, such as taxing agriculture or foreign aid. There are obviously moral reasons for reducing the mineral revenues of armed groups. However, even in this case it is important to understand that challenges such as weak governance, corruption and large compliance costs, might easily undermine their successful implementation.

The main problem in the DRC is the weakness of governance and the inability of the state to fulfill its basic functions. In such a context, ending the violence requires a long-term and comprehensive approach that combines military, political, and economic efforts, with a particular emphasis on building capable and legitimate institutions, restoring the state's monopoly on violence, and promoting economic development that is not based on illegal activities.

Introduction

In the early 2000s, tantalum – a rare metal with some unique properties – suddenly moved from being the subject of specialized geological and engineering publications into a wide public spotlight. Effective NGO campaigns using catchy slogans, such as ‘No blood on my mobile’, claimed that consumer demand in the West for mobile phones, computers, game consoles and other electronic devices, all of which contain small amounts of tantalum, fueled mass scale atrocities in the Democratic Republic of Congo (DRC). In the eyes of the general public, tantalum and coltan, a tantalum-bearing ore that is mined in the DRC, became the most visible symbol of the link between the deadly conflict in the DRC and the exploitation of mineral resources.

This case study on the link between coltan mining and armed conflict in DRC was prepared as part of the POLINARES project funded by the European Community’s Seventh Framework Programme (FP7/2007- 2013). The overall goal of the project was to examine the main global challenges surrounding access to fossil fuels and mineral resources. This study illustrates one particular aspect of this broader problem; self-imposed constraints on access to certain minerals in response to public and policy-maker sensitivity to potential links between mining and human suffering or conflict. This moves away from the more familiar problem, which was the main focus of past POLINARES projects, namely when access to minerals is limited by actions of external actors. In the future, self-imposed constraints on access to minerals may become a more common instrument to ensure international compliance with basic standards of environmental stewardship or labor conditions at mining sites. The question of whether the use of such constraints is appropriate highlights the difficulty of balancing the mutual economic benefits offered by mining to mineral producing and consuming countries against the protection of core values concerning the unacceptability of violence or forced labor.

While this report does not offer any definitive answers to this question, it does provide an illustration of the difficult trade-offs to be made between economic and normative concerns through a case study of coltan mining in the DRC and its connection with the ongoing civil conflict. It also demonstrates that there can be unintended consequences of policy measures aimed at breaking the links between coltan mining and conflict.

More specifically this report aims to answer the following research questions:

- What is the role of coltan mining in the conflict in the DRC?
- What are the main policy initiatives either proposed or put in place and what are their (potential) impacts?

Tantalum and coltan were selected as the focus of this case study due to the large amount of public attention that they have received. The fact that they became the target of highly mediatised NGO campaigns is in itself somewhat puzzling. Coltan is far from being the most important mineral that is mined in the DRC, and the DRC has never been the main tantalum supplier to the global market. This report therefore seeks to redress the largely mediatic coverage of the role of coltan mining in the DRC conflict, contributing to a more informed analysis of the relationship between the two.

It should be noted that publicly available data on reserves, production and exports in the DRC are very unreliable. Figures from different sources often show significant discrepancies. This is not particularly surprising given that the country has been engulfed in one of the most devastating conflicts since the end of the WWII. The tantalum market itself is not particularly transparent. Therefore, one should interpret most figures in this chapter more as educated estimates rather than precise measurements.¹

The report is structured in the following way. Chapter 1 provides the main facts and data on tantalum. It gives an overview of its properties and uses, discusses

1 For example, one of the most prominent sources of data on the minerals market, U.S. Geological Survey, notes in the 'Mineral Yearbook 2002' that 'data on production [in the DRC] are speculative and unreliable for estimating'.

the tantalum supply chain from mine to metal, including artisanal mining of coltan in the DRC. Finally, this chapter touches upon developments in tantalum prices which were an important trigger for coltan mining in the DRC and had significant impact on the conflict. Chapter 2 includes background information on the DRC and a short historic overview of conflict there. Chapter 3 then looks specifically at coltan mining in the DRC. This chapter gives an overview of coltan and tantalum resources in the country and it discusses the organization of coltan mining during the first and second mining booms. Chapter 4 focuses on the specific role of coltan in the present conflict in the DRC. It analyzes the involvement of armed groups in mining and mineral trade, exploring the greed and grievances model of assessing the motivations of armed groups. Chapter 5 gives an overview of the policy measures that were adopted or proposed to mitigate the negative effects of coltan mining and trade on the conflict in the DRC, and analyzes their effectiveness and efficiency. Finally, this report greatly benefited from the expertise and multidisciplinary nature of the POLINARES research consortium. The Hague Centre for Strategic Studies (HCSS) worked together with the Bundesanstalt für Geowissenschaften und Rohstoffe (BGR), Raw Materials Group (RMG) and Fraunhofer Institute for Systems and Innovation Research (ISI) on this report.

1 Key facts and figures about coltan and tantalum

Coltan is short for columbite–tantalite, a mineral containing the elements tantalum and niobium. Niobium was formerly known as columbium, hence the name columbite-tantalite. The commercial value of mined coltan is mainly determined by its tantalum content. The chapter starts with an overview of the properties and uses of tantalum, followed by a discussion of the tantalum supply chain from mine to metal. The analysis pays special attention to artisanal mining, as this is how coltan is mined in the DRC. The chapter closes with a section on the developments in tantalum pricing.

1.1 Properties and uses of tantalum²

Tantalum is a rare metal with unique properties. Thanks to its high strength, resistance to high temperatures and corrosion, ductility, inertness to the human body and other properties, tantalum is used in many metal alloys and has applications in numerous industries. Tantalum joined the group of commercially useful elements in the last century. Despite the comparatively short history of its technological use, tantalum is now a key enabler of our information and communication-intensive society.

Since the 1960s the leading use of tantalum was as a powder or wire for capacitors within the electronics industry. Capacitors are electrical components that are used to store energy in an electric field. They are used in the electrical circuits of many common electronic devices. The tantalum capacitor has a high capacitance, which is the ability to store an electrical charge, per volume and weight. This makes tantalum capacitors smaller and lighter than their alternatives (for example, made from aluminum). Despite their higher price, tantalum capacitors are widely used in mobile phones, computers and automotive electronics, where saving on weight and space is important. An average mobile phone, for example, contains around 40 milligrams of tantalum.

2 See also Luis A. Tercero Espinoza, *Case Study: Tantalum in the World Economy: History, Uses and Demand*, POLINARES Working Paper N. 28 [Polinares, March 2012], http://www.polinares.eu/docs/d2-1/polinares_wp2_chapter16.pdf.

Besides capacitors, tantalum is used in many alloys thanks to its high melting point and resistance to corrosion. It is an essential component of many nickel-based super alloys, which are used for highly stressed parts, such as the turbine blades in aircraft engines and land-based gas turbines. Others uses of tantalum include mill products for sputtering targets and chemicals for audio and video components. Tantalum is also being used in the medical industry. Its chemical inertness and non-irritant reaction to living tissue make tantalum ideally suited for surgical instruments, pacemakers, implants and joint replacements. Table 1 gives an overview of the major uses of tantalum by industry.

INDUSTRY	USAGE	CHARACTERISTICS	PRODUCT
Automotive	Anti-lock brake systems, airbag activation systems and engine management modules	High strength, resistance to high temperatures	Tantalum powder
Ceramics & surface coatings	Ceramic capacitors, glass coating, camera lenses and X- ray films	High strength	Tantalum oxide and yttrium tantalate
Chemicals	Chemical processing	Ductile, resistance to corrosion	Tantalum metal
Construction	Cathode protection systems for large steel structures such as oil platforms and corrosion resistant fasteners such as screws, nuts and bolts	High strength, resistance to corrosion	Tantalum metal
Engineering	Cutting tools	Resistance to high temperatures (carbides)	Tantalum carbide
Electronics	Capacitors, surface acoustic wave filters for sensors and touch screen technologies, hard disk drivers and led lights	High and temperature insensitive volumetric capacitance, thermodynamic stability	Lithium tantalate, tantalum powder, tantalum ingots and tantalum nitride
Medicine	Pacemakers, hearing aids and prosthetic devices such as hip joints	Bio-inertness	Tantalum metal
Metallurgical	Furnace parts, super alloys for jet engines and rocket engine nozzles	Resistance to high temperatures	Tantalum metal and ingots
Military	Missile parts, night vision goggles, and Global Positioning Systems (GPS)	Resistance to high temperatures, High and temperature insensitive volumetric capacitance	Tantalum ingots and oxide

TABLE 1: MAJOR USES OF TANTALUM BY INDUSTRY³

3 British Geological Survey (BGS), *Niobium-Tantalum Commodity Profile*, Commodity Profiles (Nottingham: British Geological Survey (BGS), 2011).

The fabrication of tantalum capacitors is reported to account for more than 60% of tantalum demand in the United States (US) today.⁴ Other sources suggest that globally the share of tantalum use for capacitors has decreased since 2004 from 42% to 24% while use of tantalum chemicals has increased from 14% to 36%.⁵ The share of other categories has remained largely unchanged over the years (see Figure 1).⁶

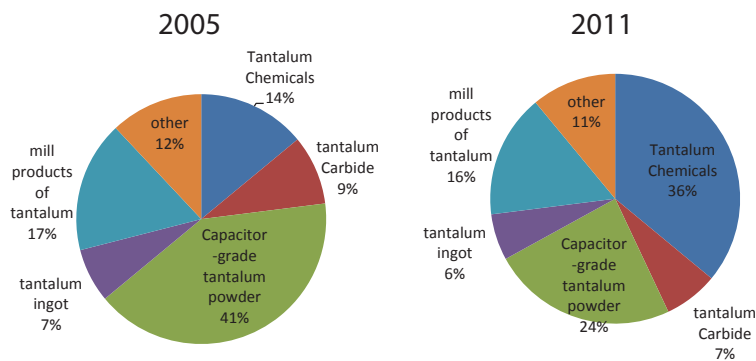


FIGURE 1: PERCENTAGE SHARE OF CATEGORY IN TANTALUM PROCESSORS' SHIPMENTS⁷

Substitution

There are substitutes available for most applications of tantalum and its compounds. The range of capacitance provided by tantalum capacitors, for example, can be largely but not completely covered by aluminum-, ceramic- or niobium-based capacitors. In particular ceramic and niobium capacitors are replacing tantalum capacitors in many applications. The use of tantalum

4 US Geological Survey, 'Mineral Commodity Summaries 2012' (US Geological Survey (USGS), January 24, 2012).

5 Tantalum-Niobium International Study Center and José Isildo de Vargas, *Bulletin No 149*, ISSN 1019-2026, March 2012, http://tanb.org/webfm_send/166.

6 Figure 1 is based on tantalum processors' shipment data. Since the tantalum market is a relatively small and high-value market, stocks (e.g. of electronic companies) can be significant. Therefore shipment data must be understood as a proxy for end-use statistics.

7 Tantalum-Niobium International Study Center and José Isildo de Vargas, *Bulletin No 149*.

in cemented carbides is in long-term decline.⁸ There are also substitutes available for mill products (e.g. glass, titanium, niobium) and high-temperature applications (e.g. niobium, tungsten, hafnium).

However, the use of substitutes is often coupled with reduced performance or lower versatility. Tantalum capacitors offer the advantage of high reliability, resistance to high temperatures and a broad range of capacitance. It is therefore expected that tantalum capacitors will remain first choice for applications requiring high reliability and resistance to elevated temperature and for which cost is not a primary consideration.

Because of the strong competition from other materials for capacitors and microelectronic applications it is expected that the consumption of tantalum will not increase substantially in the future. This is supported by data from the Niobium-Tantalum International Study Center (TIC) on tantalum processors' shipments, which were at the same level in early 2010 as in 2004.⁹ This development is also supported by the global production data of the United States Geological Survey (USGS), which show that global production in 2010 was more than 50% less than in 2004 (see Figure 5).

1.2 The tantalum supply chain from mine to metal

The supply chain for tantalum can be relatively lengthy and complex (see Figure 2), including multiple distributors and traders as well as miners and smelters. This complexity can lead to issues in tracking the raw material back to the source of supply. Insight into the tantalum supply chain is becoming increasingly important in light of legislation and guidelines aimed at preventing the use of conflict minerals.

8 US Geological Survey, 'Mineral Commodity Summaries 2012'; Volker Wischnat and Bettina Renz, 'Wo Keramik Vorsprung Schafft', *E&E-Kompodium 2007/2008* (2007): 90–92; Roskill Information Services, *The economics of tantalum*. (London: Roskill Information Services, 2009), 10.

9 Tantalum-Niobium International Study Center and José Isildo de Vargas, *Bulletin No 149*.

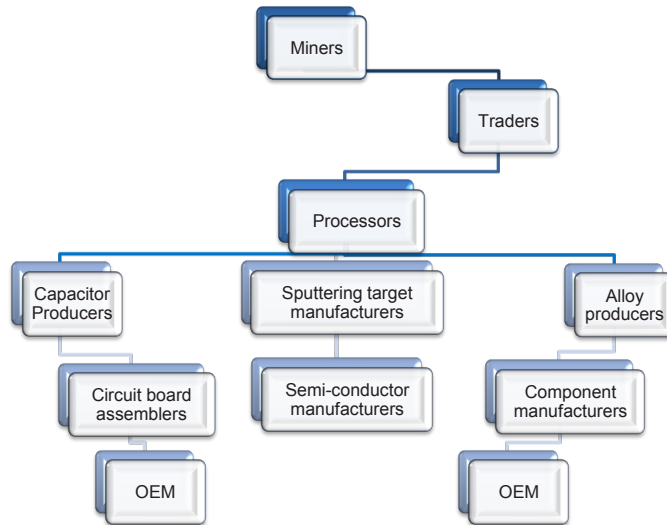


FIGURE 2: THE TANTALUM SUPPLY CHAIN
(ADAPTED FROM GLOBAL ADVANCED METALS)

Resources and reserves

Tantalum is a metallic element that is present in the Earth's crust in a vast array of minerals. Tantalum often occurs with the element niobium (previously known as columbium). The most important tantalum-niobium containing mineral concentrates are tantalite and niobite (also known as columbite). These mineral concentrates are chemically similar but contain respectively more tantalum or niobium. Coltan is an abbreviation for columbite-tantalite that is only used in parts of Africa or as a nickname for this specific mineral. Other minerals in which tantalum occurs are microlite, tapiolite, wodginite, struverite and pyrochlore.

Tantalum resources and reserves are geographically widespread. According to R. Burt, the former president of the TIC, the most likely tantalum resources are estimated at 260,000 t.¹⁰

10 Burt, R, 'Tantalum - a Rare Metal in Abundance?,' *T.I.C. Bulletin*, 2010.

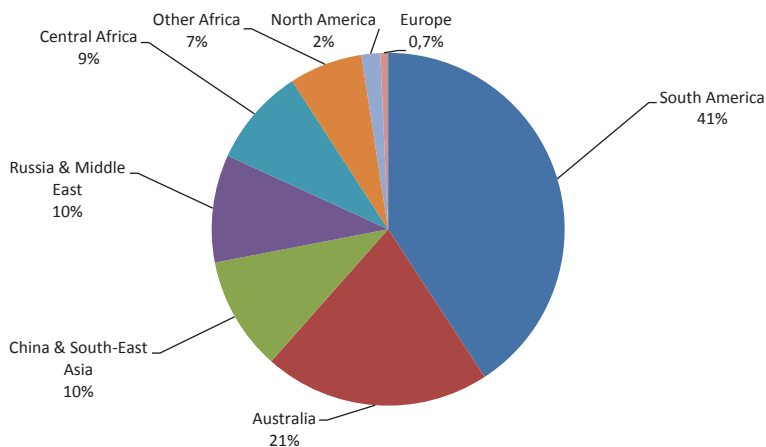


FIGURE 3: REGIONAL DISTRIBUTION OF THE MOST LIKELY TANTALUM RESOURCES, 2010
(SOURCE: BURT, 2010)

Figure 3 shows the distribution of the most likely tantalum resources by geographic region. The largest indicated and measured (or known) tantalum resources in the world are found in South America (106,000), mainly in Brazil; and in Australia (53,900).

Reserves are the part of the resources that can be economically extracted using existing technologies at the time of determination. Tantalum reserves are quite significant and do not suggest any geological constraints on tantalum production at least in the medium-term perspective. Global tantalum reserves amounted to 120,000t in 2012 according to the USGS.¹¹ One metric that can be used to compare the geological availability of different minerals is the reserves to production ratio. For tantalum this ratio suggests that there are more than 130 years of available supply (using the average primary production of tantalum in 2007-2011 of circa 910 tonnes). This is much more than for many other minerals.

11 USGS, *Mineral Commodity Summaries 2012: Tantalum*, Mineral Commodity Summaries (USGS, 2012), <http://minerals.usgs.gov/minerals/pubs/commodity/niobium/mcs-2012-tanta.pdf>.

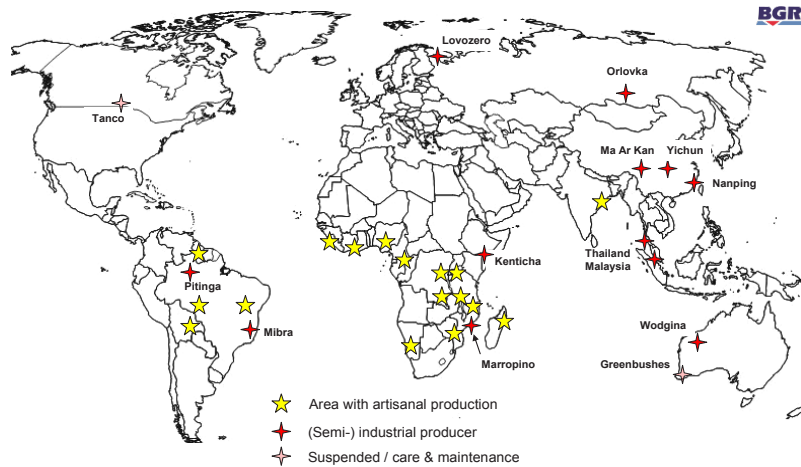


FIGURE 4: MAJOR TANTALUM MINING SITES

(SOURCE: BGR, 2010)

Tantalum mining

The tantalum supply chain starts with the mining of tantalum-containing ores. Conventional and artisanal and small-scale mining (ASM) takes place around the world. Figure 4 shows where tantalum mining takes place globally. The Great Lakes region is the center of tantalum mining in Africa with the DRC being the largest African producer. Most of tantalum mining in Africa is artisanal and small-scale. The major exceptions are the Marropino mine in Mozambique and the Kenticha mine in Ethiopia.

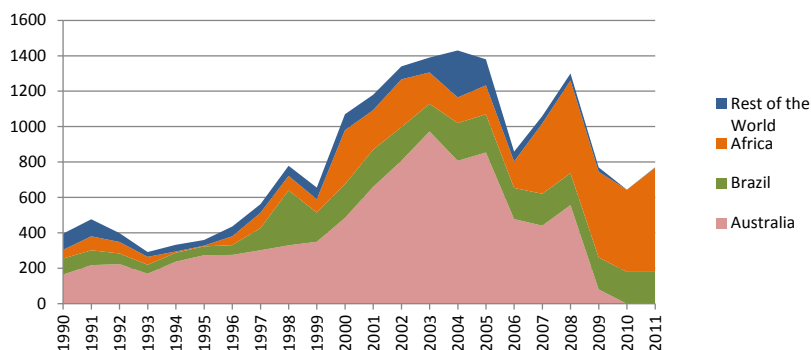


FIGURE 5: GLOBAL TANTALUM PRODUCTION, 1990-2011 (IN TONNES OF TANTALUM CONTENT)

(SOURCE: USGS DATA)

Figure 5 shows the fluctuations in global production over time from 1990 to 2010 and the relative contributions of Australia, Brazil, and Africa. Existing mining operations respond relatively quickly to changing market conditions (see Appendix A for an overview of past, present and planned mining projects). When demand and prices are low, mines are closed only to be reopened again when demand picks up and prices rise. The global economic crisis slowed demand for tantalum and led to the temporary closure of some of the largest tantalum mines.

In the fall of 2008 as the global financial crisis reached its apogee, the demand for tantalum from electronic industries started to fall. Consequently this led to the closure of several mines in Mozambique, Canada and Australia. Talison Minerals Pty (now known as Global Advanced Metals), the largest global producer of tantalum, for example, decided to close down production at the two largest Australian tantalum mines, Wodgina and Greenbushes, in December 2008.¹² In 2009, after the closure, Australia's share of global tantalum production fell to 10%. Next year, in 2010, no tantalum at all was produced in Australia.¹³ In 2009, the Tanco mine in Canada and the Marropino mine in Mozambique were also

12 Swiss Metal Assets, 'Dodd-Frank, Australian Cuts Threaten Tantalum,' Swiss Metal Assets, February 14, 2012, <http://www.swissmetalassets.com>.

13 Raw Materials Group, 'Raw Materials Data - Tantalum,' *Raw Materials Data (RMD) - Metals, Iron Ore and Coal Database*, 2012, http://www.rmg.se/index.php?option=com_content&task=view&id=25&Itemid=89.

temporarily closed.¹⁴ As a result, global production of tantalum dropped by 40% from 1270 tonnes in 2008 to 764 tonnes in 2009. Most mines re-opened in the course of 2010 and 2011. In 2011, an estimated 790 tonnes of tantalum ore were mined.

Artisanal mining

Artisanal and small-scale mining (ASM) is done by individuals, family units, worker cooperatives or small companies with minimal or no mechanization, often informally or illegally.¹⁵ Not every mineral is suitable for artisanal mining. Geological factors that support economies of scale and mechanization (uniformity of deposit, width of ore bodies, depth, overburden) tend to render ASM unprofitable. On the other hand, small deposits and irregular ore bodies create economic opportunities for ASM.

The most important factor for the economic competitiveness of artisanal mining is a high value per unit of weight of the ore mined. Coltan is a quite valuable material in this respect with prices having exceeded US\$100 per kg of tantalum content. It is therefore no coincidence that artisanal mining accounted for more than a quarter of total global production of tantalum in 2009, which is one of the highest percentages compared to other metals.¹⁶ Since ASM is based on extensive use of labor, low wages are also essential for its economic competitiveness. Finally, the factors that make large mining investment more expensive or risky also make ASM comparatively more attractive. Such factors might include remote location of deposits, difficult terrain, absence of infrastructure (roads, electricity, water), and high political risk including lack of rule of law.

Compared to industrial mining artisanal mining is a less capital-intensive method of mining. Other features of ASM include flexibility and a fast response time. For a large industrial mine it typically takes many years to bring the mine into production, while mines developed by artisanal miners can often start producing in a few days. The ability of artisanal mining to react quickly to

14 Globe Metals & Mining, 'Globe Metals & Mining - Tantalum,' *Globe Metals & Mining*, 2012, <http://www.globemetalsandmining.com.au/Commodities/Tantalum.aspx#.UlhiwVfQcXV>.

15 Dorner, U., G.Franken, M.Liedtke and H.Sievers, Artisanal and Small-Scale Mining (ASM), POLINARES working paper n.19, March 2012., p.1

16 Dorner, U., G.Franken, M.Liedtke and H.Sievers, Artisanal and Small-Scale Mining (ASM), POLINARES working paper n.19, March 2012., Figure 3.

changes in the market comes from the fact that artisanal miners typically do not have labor contracts with fixed wages but are paid a fixed percentage of their production. Economically it means that these entrepreneurs bear all market risks themselves. If mineral prices drop significantly some of them will abandon mining because it becomes less attractive and switch to other economic activities. Thus the supply side of the coltan market in the DRC is close to what economists call ‘perfect competition’ with many small price-taking producers.

Primary and secondary production

In addition to specialized tantalum mining, tantalum is also produced from tin slag and scrap. Tin slag is a by-product of tin smelting. Over the last decade tin slag has accounted for up to 20% of total tantalum supply.¹⁷ Tantalum, and other metals, can be produced from different sources of scrap metal. There is scrap from manufacturing (i.e. new scrap) and scrap from products at the end-of-life (i.e. old scrap). New scrap is the most widely available and most tantalum scrap is generated during the manufacturing of electronic components, cemented carbides and superalloys.¹⁸ The recycling efficiency, and ultimately also the share of recycled tantalum in the total tantalum consumption, is determined by the amount of tantalum in scrap; tantalum prices; previous industrial experience; and available technologies for processing scrap.¹⁹

The economic crisis and the shutting down of major mines has had a significant impact on the relative shares of primary and secondary production. Before 2008, 60% of tantalum supply came from primary concentrates, a further 10% each from secondary concentrates and from tin slag. The final 20% of global production was accounted for by scrap recycling. Post-2008, the share of production coming from primary concentrates dropped sharply to 10% in 2010, recovering to 27% by 2011. To compensate for the gap, tantalum production from tin slag and scrap increased.

17 Roskill Information Services Ltd, *The Economics of Tantalum*.

18 USGS, *Tantalum*; TIC, ‘Critical raw materials for the EU - Report of the Ad-hoc Working Group on defining critical raw materials,’ 2010, http://ec.europa.eu/enterprise/policies/raw-materials/files/pc-contributions/org-050-tantalum-niobium-international-study-center-tic_en.pdf.

19 TIC, ‘Critical raw materials for the EU - Report of the Ad-hoc Working Group on defining critical raw materials’; Larry D. Cunningham, *Tantalum Recycling in the United States in 1998* (USGS, 1999), <http://infohouse.p2ric.org/ref/45/44147.pdf>.

Concentration

After mining, tantalum-containing ores are concentrated at or near the mine site to increase the share of tantalum oxide (Ta_2O_5) in the concentrate. Tantalum ore traded on international markets should contain a minimum of 30% of Ta_2O_5 . Ores with lower grades of a minimum 20% Ta_2O_5 may be acceptable to some buyers.

Trading and processing

The next step in the supply chain after mining is the trading and processing of tantalum. Tantalum is usually traded in three forms: as ore concentrate, as tantalum oxides and salt, or as capacitor-grade tantalum. Tantalum is not traded on an open exchange, such as the London Metal Exchange. Instead, negotiations take place on a bilateral basis between buyers and sellers around the world. Prices are privately discussed and purchase contracts between buyer and seller are confidential. Large shares of tantalum are sold through long-term contracts with fixed prices. The Advanced Metallurgical Group (AMG), for example, is one of the largest producers of tantalum concentrate. By March 2011, AMG had already sold all its tantalum production until the end of 2012 by entering into supply agreements at fixed prices with its traditional customers. Price data for tantalum are only available through subscriptions to mineral price data firms (such as Asian Metal, Metal Pages, Platts and Ryan's Notes) which construct market prices based on reporting by firms and industry sources.

Traders subsequently ship the tantalum concentrates to processors. The processors extract the tantalum from the concentrates and then sell the refined material to producers of capacitors, sputtering targets and alloys, who in turn supply circuit board assemblers, and manufacturers of semi-conductors and components. They subsequently sell their products to original equipment manufacturers (OEMs), which constitute the end of the global tantalum supply chain.

Previously, many processors and other buyers of tantalum products relied on inventories built up by the industry and the US Defense National Stockpile Center (DNSC). For a long time, the DNSC was a significant supplier – and between 2001 and 2007 even the second largest supplier – of tantalum ore to the processing industry. By 2009 the strategic stockpile of tantalum of the US was exhausted and sales have stopped. The remaining quantity of tantalum ore is no

longer of any significance.²⁰ Before the early 2000s, the tantalum industry also held substantial inventories of tantalum ore. Most of these inventories, however, have now also been exhausted, such as the Global Advanced Metals inventory.²¹

1.3 Price developments

Like the prices of other minerals, prices for tantalum ore are mainly influenced by developments in the supply of and demand for products in which it is used. Published spot prices for tantalite ore have shown long-term stability interrupted by very sharp price jumps (see Figure 7).

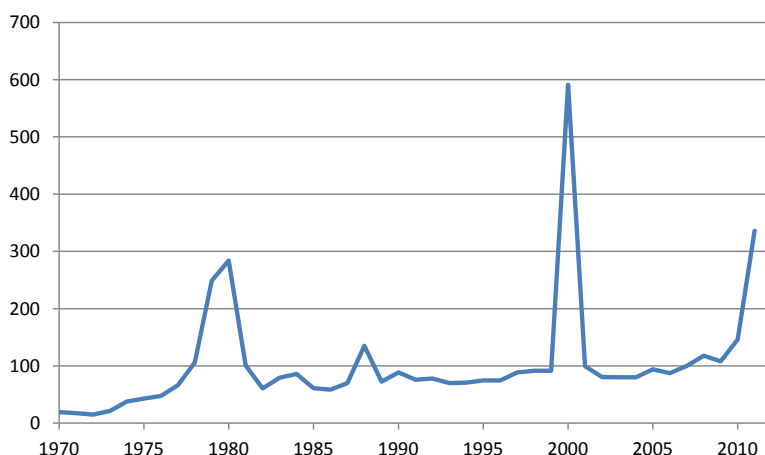


FIGURE 6: THE AVERAGE YEAR-END NOMINAL TANTALITE SPOT PRICE (IN US\$ PER KG OF TANTALUM CONTENT)²²

(BASED ON USGS DATA)

20 Papp, J.F., 'Niobium (columbium) and Tantalum - 2008.,' in *U. S. Geological Survey Minerals Yearbook - 2008*. (U. S. Geological Survey, 2010), 52.1–52.14.; Roskill Information Services Ltd, *The Economics of Tantalum*.

21 Papp, J.F., 'Niobium (columbium) and Tantalum - 2008. '; Roskill Information Services Ltd, *The Economics of Tantalum*.

22 Price of tantalite ore is typically reported by trade journals in US dollars per pound of tantalum pentoxide content. It was converted by the USGS into US dollars per tonne of contained tantalum. These, however, are not prices for refined tantalum, which are obviously significantly higher.

The first price surge occurred from 1978 to 1980 when average prices rose from about 66 US\$/kg in 1977 to over 284 US\$/kg in 1980 (these are nominal average prices at the end of the year as reported by the USGS). This price hike was largely brought about by panic buying influenced by shortages of supply and expected increases in tantalum demand for electronic components. Large tantalum inventories were built up during this period. The tantalum surplus in inventories, substitution and recycling of electronic components resulted in decreasing prices in 1982.²³

The second rapid escalation in tantalite prices occurred in 1988 when tantalum prices almost doubled from about 70 US\$/kg in 1987 to 135 US\$/kg in 1988. This price peak was due to increased tantalum demand and depleted tantalum inventories.

The third price boom led to record tantalite price levels in 2000. From 1999 to 2000, prices rose more than six-fold – from 91 to 590 US\$/kg due to expectations of high demand in the electronic industry, over-ordering and apparent shortage. Again, the price peak was short-lived and prices crashed in 2001, as a result of excess stocks combined with a downturn in demand from the electronics sector, due in part to substitution of tantalum capacitors in some applications. As during the previous coltan boom, large inventories were built up again.

Finally, after the period of quite stable prices in 2001-2010, in 2011 tantalite prices surged to 340 US\$/kg, more than the double level of 2010 or triple of 2009. It is probably too early to single out specific factors driving the current price surge but most likely that significant cuts in mine production (see Figure 5) have played a substantial role.

Price fluctuations have played a major role in the development of coltan mining in the Congo. The price spike of 2000 had especially significant effect on coltan mining in the DRC, and the closure of industrial mines in 2008 due to the economic downturn enabled artisanal mining in the DRC to flourish.

23 Cunningham, *Tantalum Recycling in the United States in 1998*.

1.4 Environmental impact

Mining of coltan can cause environmental damage through the deterioration of landscapes. In the DRC, one of the concerns has been large-scale deforestation: miners are chopping down forests to make land available for mining and living-space. Wood is also needed to build mining structures and camps near the mine sites, and as firewood for cooking and heating. Deforestation has had several negative effects on plant and wildlife. The rapid development of mines has put rare plant species at risk and destroyed the natural habitat of the gorilla. Deforestation has also contributed to soil erosion and subsequently to silting in rivers.

Further down the supply chain, the transportation of tantalum-containing minerals requires care, as these minerals often contain somewhat elevated levels of naturally occurring thorium and uranium, usually high enough for them to be classified as radioactive for handling and transport. It is the responsibility of the producer or trader to assess the presence of such materials and to certify whether the material is radioactive or not.

In solid form, tantalum poses no particular environmental problems. The US Center for Disease Control (CDC) classifies tantalum dust as a material with a low order of toxicity. If the smelting and refining, cutting, grinding, metaling or any other operation generates dust or fumes, exposure to airborne material should be monitored. Metal powder or dust may have a significant impact on air and water quality. Emissions, spills and releases into the environment should be controlled immediately.

2 The Democratic Republic of Congo

This chapter provides background information on the Democratic Republic of Congo (in this report it is abbreviated as the DRC but can also be referred to as DR Congo or the Congo). First, it briefly describes the demographic and economic situation in the DRC, which is relevant for understanding the causes and context of conflict in the country. Next, it provides a short historic overview of recent conflict in the DRC and the various contributing factors. Appendix B contains a list of the key people and groups involved.

2.1 Background information

The DRC is a country located in Central Africa. It covers an area of 2.3 million km² which makes it the second largest country in Africa (after Algeria) and the largest country in Sub-Saharan Africa.²⁴ In terms of territory, the DRC is as large as the five largest member states of the EU put together (France, Spain, Sweden, Germany and Finland).

Population

The DRC's population – the third largest in Africa – is estimated at 73.6 million and is growing rapidly. The population has more than doubled since the last census of 1985 when it was only 34.7 million. The total fertility rate in the DRC (i.e. the average number of children that will be born to a woman in her lifetime) has been falling rapidly but was still six in 2008.²⁵ The DRC's population is ethnically diverse, containing more than 200 distinct ethnic groups. In addition to French, which is the official language, there are four recognized national languages – Lingala, Kikongo, Kiswahili, Tshiluba – and various local languages

24 Unless specifically noted otherwise general data on the DRC in this sub-section are from World Bank's World Development Indicators database, <http://data.worldbank.org/data-catalog/world-development-indicators>

25 CIA World Factbook, <https://www.cia.gov/library/publications/the-world-factbook/geos/cg.html>

and dialects.²⁶ Many Congolese have a strong sense of identity based on a their ethnic (and often sub-ethnic) group.²⁷ Such groups exist in every province of the DRC. Rivalry between different ethnic groups was at the origin of multiple rebellions that took place in the early 1960s.

Economic performance

The economic performance of the DRC has been disastrous and the current standard of living is extremely low. Figure 7 shows the development of gross national income (GNI) per capita in the DRC as a percentage of GNI per capita in Sub-Saharan Africa. It shows that in 1963, at the outset of its independence, the DRC had a GNI per capita that was almost twice as high as the average level for Sub-Saharan Africa (or more exactly 188%).²⁸ In 2011 had it dropped to just 15%.

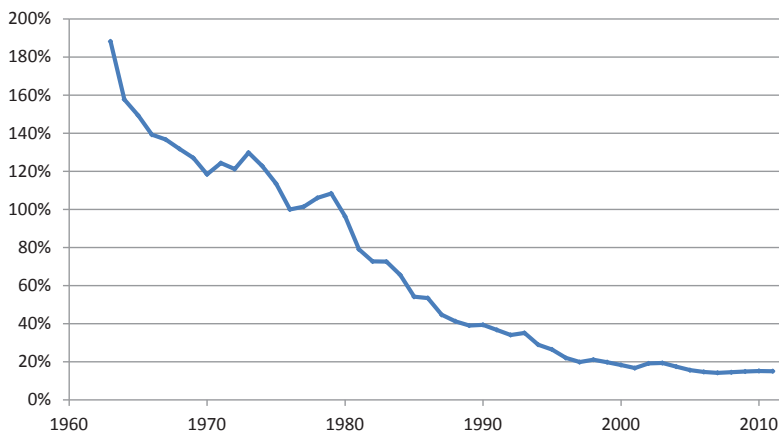


FIGURE 7: GNI PER CAPITA IN DRC CONGO AS A PERCENTAGE OF GNI PER CAPITA IN SUB-SAHARAN AFRICA (BASED ON WORLD DEVELOPMENT INDICATORS AND AUTHORS' CALCULATIONS)

26 Ibid

27 Gambino, Tony, Democratic Republic of Congo. Background Case Study for the World Development Report 2011, March 2, 2011,

28 It should be noted that GNI per capita is a limited measure of living standards. Although in 1960s GNI per capita in DR Congo was relatively high compared to other Sub-Saharan African countries other development indicators, such as life expectancy or child mortality, indicated that living standards for most of population in the DRC were not markedly better than in neighboring countries. A very high concentration of wealth and income in the hands of small elite is the most obvious explanation for this discrepancy.

It should be noted that Sub-Saharan Africa has been growing significantly slower than the rest of the world over this period. When the DRC is compared to countries that performed better in terms of GNI per capita growth than the Sub-Saharan African countries, it becomes even more clear that the DRC has been falling into an economic abyss. In the early 1960s, per capita GNI in the DRC was double of that in South Korea and three times as high as in Botswana. In 2011, this indicator was 110 and 40 times higher in South Korea and Botswana respectively than in the DRC. In the period from 1989 till 2001, the DRC's Gross Domestic Product (GDP) declined every year, except in 1995. All these figures indicate that Congo's formal economy had practically collapsed even before the recent wave of conflicts, which started in 1994-1996.

The DRC is at the very bottom of various global development rankings. For example, the DRC had the lowest value of the Human Development Index published by the United Nations Development Program, which combines measures of life expectancy, educational attainment, and income.²⁹ Congo's infant mortality rate (110.6 per 1,000 of live births in 2011) is the third highest in the world (only Somalia and Mali have a higher rate). Physical infrastructure in the DRC remains rudimentary. Poor road systems and large distances make transport between Congo's eastern provinces, where coltan is mined, and the rest of the country difficult and expensive.

Natural resources

At the same time, some observers consider the DRC as a wealthy country because it has large deposits of various minerals including diamonds, gold, copper, cobalt, zinc and coltan (see Figure 8).

29 UNDP, Human Development Report 2011. Sustainability and Equity: A Better Future for All, 2011, http://hdr.undp.org/en/media/HDR_2011_EN_Complete.pdf.

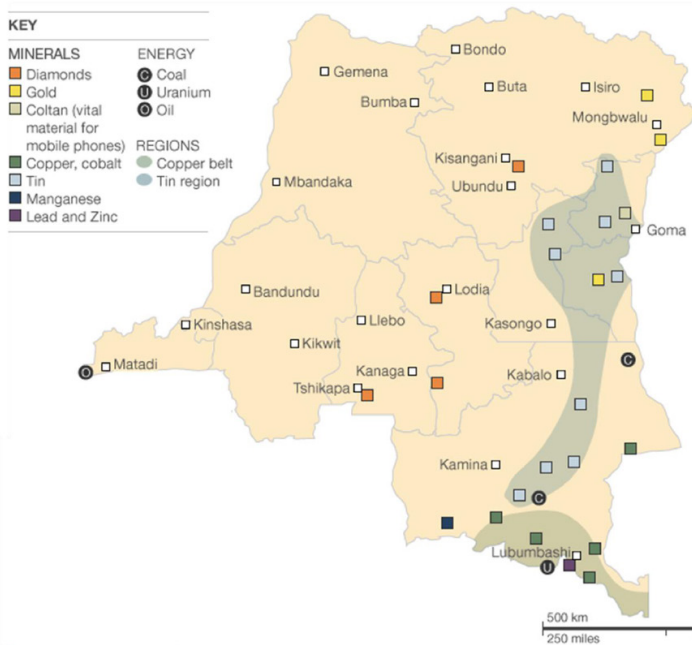


FIGURE 8: MINERAL DEPOSITS IN THE DRC
(SOURCE: UN)

The mining industry has been a cornerstone of the Congolese economy since the colonial times. Historically, the mining industry accounted for 25% of Congo’s GDP and about three-quarters of total export revenue. Uranium from the DRC was used at the Manhattan Project in the US to build the first nuclear bomb. In the late 1980s (and in recent years) the country was the largest global producer of cobalt and one of the largest of industrial diamonds and copper. However, economic mismanagement and the degradation of Congolese state institutions affected the mining sector as well. In 2000, despite the mineral riches of the DRC, the sector’s share of the GDP dropped to an estimated 6%.³⁰

30 Coakley, George J. 'The Mineral Industry of Congo (Kinshasa).' In U.S. Geological Survey Minerals Yearbook -2002. USGS, 2002.

An explosive mix

Many factors that substantially increase the risk of civil war or violence are present in the DRC. A comprehensive review of empirical political science literature by J. Dixon (2009) shows that factors such as a large population, large territory, ethnic heterogeneity and declining living standards closely correlate with an increased likelihood of civil war.³¹ High infant mortality rate has also been found to be a reliable proxy for a higher risk of conflict.³²

A large number of conflicts in neighboring states is another factor contributing to a higher chance of violence. Some examples of recent conflicts in states that border the DRC include the civil war and genocide in Rwanda, the Lord's Resistance Army rebellion in Uganda, the long-lasting civil war in Angola between MPLA and UNITA. Conflicts in neighboring states often have a tendency to spill over the borders and, as a result, to increase the risk of civil war in contingent states. Conflict in the DRC has invariably had a strong international dimension.

The abundance of natural resources may be an additional factor that increases likelihood of conflict in the DRC. Whereas natural resources such as fertile land are generally considered beneficial for economic development, so called 'point-source' non-renewable resources, such as minerals, oil and gas, often make countries vulnerable to conflict.³³ It is not possible to definitively conclude that all minerals resources increase the probability of civil war (such a link was repeatedly confirmed only for oil). However, statistical analyses indicate that some minerals may lengthen pre-existing wars. In the case of the DRC, there are indications that coltan along with other minerals was one of the factors that prolonged the recent conflicts in the Congo (although its contribution was never decisive, see chapter 3).

31 Dixon, Jeffery, 'What Causes Civil Wars? Integrating Quantitative Research Findings', *International Studies Review* (2009) 11,p. 707-735.

32 Goldstone, Jack A., Robert H. Bates, David L. Epstein, Ted Robert Gurr, Michael B. Lustik, Monty G. Marshall, Jay Ulfelder, and Mark Woodward. 'A Global Model for Forecasting Political Instability.' *American Journal of Political Science* 54, no. 1 (January 2010): 190-208. doi:10.1111/j.1540-5907.2009.00426.x.

33 World Bank. *World Development Report 2011: Conflict, Security, and Development*. Washington DC: World Bank, 2011, table 2.1, p. 81

Disentangling various factors that contributed to economic decline and violence in the Congo may be next to impossible, but it is obvious that, due to an explosive mix of factors, the risk of conflict in the DRC would be high even without taking into account its mineral wealth.

2.2 Brief history of conflict in the DRC

The modern history of the Congo has been marred by numerous conflicts since its independence from Belgian colonial rule. The first national elections were held in May 1960 and independence was declared on June 30, 1960. The turbulent period between 1960 and 1966 was marked by several conflicts and rebellions and is now known as the Congo Crisis. The newly independent state was quickly overwhelmed by political instability and chaos. In September 1960, Joseph Mobutu, then Chief of Staff of the Army, seized power in a military coup, temporarily suspended parliament and arrested the first prime minister of the country, Patrice Lumumba, who was executed in January 1961. The country faced secessionist movements in the provinces of southern Kasai and Katanga (see Figure 9), and an insurrection of the *Conseil National de Libération* (CNL). The CNL set up a short-lived revolutionary government in the eastern part of the country. In November 1965, Mobutu seized power again through a military coup d'état backed by Belgium and the US.

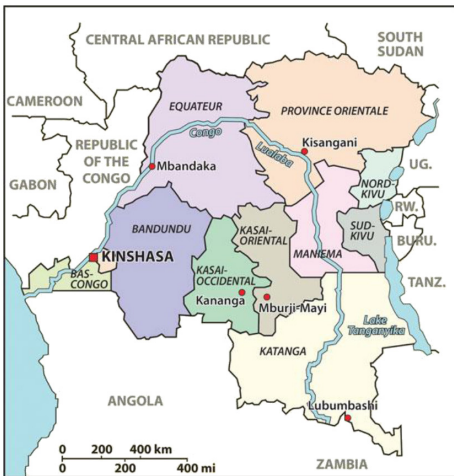


FIGURE 9: POLITICAL MAP OF THE DRC
 (SOURCE: CANADIAN MILITARY JOURNAL VOL. 11, NO. 3, 2011)

Mobutu remained in power for 32 years and renamed the country Zaire in 1971. During his rule the intensity of conflicts declined but the country was never really stable. Several rebellions aimed at ousting the dictator from power emerged at the end of the 1970s. The ‘Shaba rebellions’ out of neighboring Angola and Zambia in 1977-78, found their origin in the prior secessionist struggle in Katanga. However, they did not mobilize popular support and were ultimately defeated by the national army, the Forces Armées Zaïroises (FAZ), assisted by Western allies.

Overall, Mobutu’s thirty-two-year long rule was characterized by a single-party political system, a culture of corruption and economic mismanagement. As a result *le mal Zaïrois* (the Zairian Sickness) became synonymous with the country.³⁴ The country essentially became a failed state. For example, in 1991 and 1993, unpaid army soldiers pillaged the capital, Kinshasa.³⁵ Yet, the most deadly conflict in the Congo began at the very end of Mobutu’s rule. The events leading up to the overthrow of Mobutu are known as the First Congo War.

First Congo War (1996-1997)

A downward spiral encapsulating the whole Great Lakes region was set in motion in the spring of 1994 when over 800,000 Tutsis and moderate Hutus were killed in Rwanda. The genocide ended when the Tutsi-based Rwandan Patriotic Front (RPF) defeated the Rwandan Armed Forces (FAR) and the Interahamwe militia, which led to a large number of the Rwandan Hutus crossing the border into the Congo. Approximately a million refugees were grouped in camps on Congolese territory. Members of FAR and Interahamwe often used these camps as a staging ground for cross-border raids to Rwanda.³⁶ This influx of refugees changed not only the regional dynamic, but altered the local ethnic balance and political administration in eastern Congo.

In the summer of 1996, a crisis erupted when Kivu politicians threatened to expel a Congolese Tutsi group, the Banyamulenge, from Congo. Locally, Tutsis were

34 Mobutu renamed the country Zaire in 1971.

35 Stearns, J., *Dancing in the Glory of Monsters*, Public Affairs, New York, 2011

36 ‘The Refugee Crisis In The Great Lakes Region: Background Information.’ Amnesty International, 1996.

increasingly becoming targeted by other groups.³⁷ The Rwandan government's repeated calls to disarm the armed groups of ex-FARs clustered throughout the refugee camps did not receive any response. These two matters served as pretext for Rwanda to invade the Congo, which marked the start of the First Congo War. Rwanda was supported by Uganda, Angola and Burundi. Other African states, such as Zambia, Zimbabwe and Ethiopia, provided limited military or financial support to the invasion.

In October 1996, the *Alliance des Forces Démocratiques pour la Libération du Congo* (AFDL) was formed in Kigali, Rwanda. This armed group was primarily organized by Rwanda and Uganda, which provided it with training, equipment and bases, and was commanded by Laurent Kabila.³⁸ As his march across the Congo towards Kinshasa proceeded, AFDL's popular support grew. The weakened and disorganized Zairian army was unable to prevent the invasion. Following AFDL's swift advance, Mobutu fled Kinshasa in May 1997 and Laurent Kabila declared himself the president of the country that was renamed the Democratic Republic of Congo (DRC).

Second Congo War (1998-2003)

As soon as the First Congo War officially ended, regional actors were already on the verge of a new confrontation. In fact, violence against and mass displacement of civilians never ended. Neither did claims from neighboring states that Congo harbored armed groups opposing their respective governments. Moreover, Kabila refused to share power with Mobutu's longtime opponents. The Congolese popular support for the presence and activity of Rwandan troops in the DRC's capital was increasingly eroding and the army started to be perceived as an occupying force. Kabila ordered all Rwandan troops to leave the country in July 1998. The shift severely damaged bilateral relations between the DRC and Rwanda. Protesting the measure, two units of Congolese Tutsi soldiers mutinied and army infighting followed on August 2, 1998, provoking Rwandan military units to cross the border into the DRC to support the insubordination.

37 Office of the High Commissioner for Human Rights (OHCHR). 'Democratic Republic of the Congo, 1993 - 2003.'

38 Rwanda, Uganda and Angola provided training, equipment and bases to the AFDL. Schatzberg, Michael G. 'Beyond Mobutu: Kabila and the Congo.' *Journal of Democracy* 8, no. 4 (October, 1997): 70-84.

Under the banner of a new movement, the *Rassemblement Congolais pour la Démocratie* (RCD), Rwanda along with Uganda and (later) Burundi aimed to overthrow Kabila and to secure their borders.³⁹ This alliance, in its makeshift composition, was a pluralistic assemblage of actors, ranging from former Mobutists to former Mobutu opponents. During the first few weeks of its offensive, the RCD managed to take control of the main towns in North and South Kivu, Orientale Province and North Katanga and broke into the province of Équateur (see Figure 9). The Kabila regime, anticipating military defeat given the poor state of the *Forces Armées Congolaises* (FAC), mobilized support among other African nations. Angola was the first to intervene militarily on behalf of Kabila in August 1998, fighting the Rwandese-Ugandan forces in western Congo. Subsequently, troops from Chad, Sudan, Namibia and Zimbabwe intervened to support Kabila.

Over the course of this interstate warfare a stalemate emerged. The DRC was *de facto* partitioned. The eastern zone was controlled by the RCD. Kabila controlled the western provinces. He also incorporated Interahamwe/ex-FAR Rwandan forces into his army and forged an alliance with Congolese guerillas, the Mai-Mai. The Mai-Mai, in turn, extended the alliance to Rwandan and Burundian insurgency groups, who were consequently provided with arms and political support from Kinshasa.⁴⁰ On the other end, the Rwanda-Uganda cooperation faltered, causing the RCD to split violently into factions with rivaling spheres of influence. Additionally, another rebel movement was created over the course of 2003, the *Mouvement de Libération du Congo* (MLC) led by Jean-Pierre Bemba. With support from Uganda it was soon gaining prominence in northern Congo.⁴¹

The unfolding humanitarian catastrophe in the country, the lack of military breakthroughs, and the growing external pressure led to several conciliatory efforts, initiated by Libya and South Africa. In July 1999, six states involved in

39 The RCD was a convulsion based on ex-Mobutoists, Banyamulenge and intelligentsia. Rwanda sent troops in support numbering into thousands of soldiers. Diverging interests prevented a common agenda to be articulated, resulting in the fracturing of the movement. 'Congo's hidden war.' *The Economist*, June 2000.

40 Weiss, Herbert F., and Carayannis, Tatiana. 'Reconstructing The Congo.' *Journal of International Affairs* vol. 58, no. 1 (Fall 2004): 115 - 141.

41 'BBC News | AFRICA | How Uganda and Rwanda fell out.' BBC NEWS, June 2000. <http://news.bbc.co.uk/2/hi/africa/781810.stm>.

the conflict signed the Lusaka Ceasefire Agreement.⁴² A comprehensive agenda for disarmament, withdrawal of foreign forces and a process of 'Inter-Congolese Dialogue' was articulated. However, the progress in implementing the peace agreement over the next 18 months was very limited, with all parties violating the terms.

Upon Kabila's assassination on January 16, 2001, his son Joseph Kabila became president of the DRC. He caused a breakthrough by actively engaging in the national dialogue for a new institutional framework. Separate peace treaties were signed with Rwanda and Uganda. From September 2002 onwards, Zimbabwean, Angolan, Namibian, Rwandan and Ugandan troops began to pull out from Congolese territory. This development was welcomed by the international community, but it also left the eastern provinces in a power vacuum filled by militias, criminal networks and proxies of foreign state actors.⁴³

In December 2002, in Sun City, South Africa, the Global and Inclusive Agreement on the Transition in the Democratic Republic of Congo was signed by the government, MLC, RCD and most of the opposition parties. Based on the Agreement, a new transitional government, composed of representatives from armed and unarmed opposition parties would construct the steps towards general elections. The new constitution was promulgated subsequently on February 18, 2006. Notwithstanding the fragility of the state of affairs, the transitional authorities did succeed in organizing the first democratic presidential and parliamentary elections in 2006, largely funded by donor nations. Kabila was elected in a second-round vote, judged by international observers as relatively free and fair, even though some violent clashes occurred.

Kivu Conflict in Eastern Congo (2004-present)

Most of the challenges that Kabila had to face during his first five-year term in office stemmed from the eastern provinces: North and South Kivu, as well as Ituri, where earlier wars originated and low-intensity conflict continues to linger.

42 Angola, DRC, Namibia, Rwanda, Uganda and Zimbabwe were signatories to the Lusaka Ceasefire Agreement.

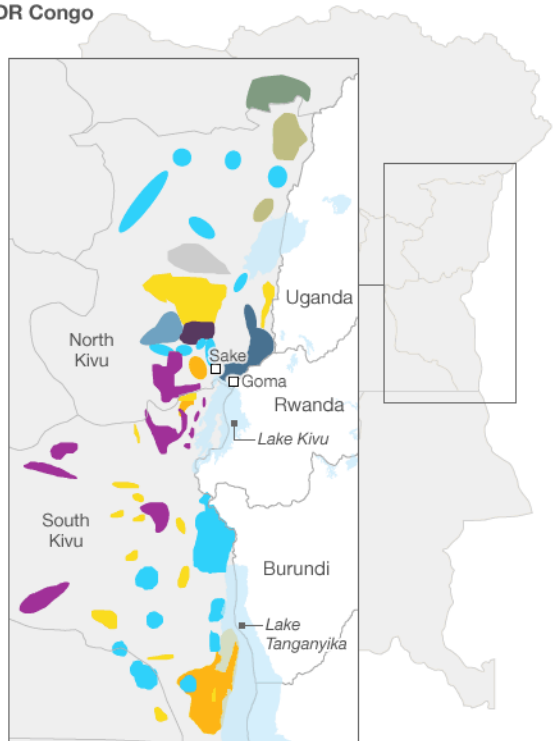
43 'Report of the Panel of Experts on the illegal exploitation of natural resources and other forms of wealth of the Democratic Republic of Congo.' United Nations, October 2003, and: 'Interim report of the Group of Experts on the Democratic Republic of the Congo.' United Nations, January 2007.

The local dynamics from 2006 onwards were shaped by a hostile residue of warring groups (see Figure 10), ethnic tensions, and complete lack of state services. Defected general Laurent Nkunda and his militia CNDP⁴⁴ continued to battle the Congolese army. The Hutu army FDLR⁴⁵ staged attacks on the civilian population. Additionally, the Mai-Mai guerilla groups, excluded from the transition process, did not disarm and also contributed to local instability.

Rebel groups in eastern DR Congo

UN forces and the Congolese army are present in large towns

- **ADF-NALU**
Ugandan-led Islamists
- **APCLS**
Mai Mai group
- **FDLR**
Mostly Hutu Rwandan rebels
- **FRPI**
Based in gold-rich Ituri region
- **M23**
Mostly Tutsi, said to be Rwandan-backed
- **Rai Mutomboki**
Anti-FDLR group
- **Sheka**
Mai Mai group
- **UPCP**
Loose coalition of smaller nationalist groups
- **Mai Mai groups**
Local forces claiming to act in self-defence
- **Other armed groups**



Source: Oxfam

FIGURE 10: ARMED GROUPS IN THE EASTERN DRC

44 CNDP is the acronym for *Congrès National pour la Défense du Peuple*, an armed group dominated by Congolese Tutsis and backed by Rwanda, which was established in 2006.

45 FDLR is the acronym of *Forces Démocratiques de Libération du Rwanda*, a militia which is composed of ex-FAR and Interahamwe fighters.

DRC President Kabila devised informal bilateral deals with Rwanda's President Kagame and their Ugandan counterpart Museveni to open a joint-assault on specific faction-controlled areas.⁴⁶ In early 2009, Rwandan forces and the FARDC launched a joint operation against the FDLR in the Kivu provinces. The operation only dispersed rebel groups temporarily rather than defeated them. However, Rwanda put pressure on the CNDP to disarm and arrested its leader Laurent Nkunda in January 2009. Concurrently, the DRC signed a peace agreement with the CNDP, which declared the intention to be integrated into the FARDC and to fight the FDLR.

In April 2012 former CNDP soldiers in the FARDC mutinied and formed a new armed group, the March 23 Movement (M23), under leadership Bosco Ntaganda. The group claimed that the Congolese government failed to keep its side of the agreement on the integration of former CNDP soldiers into the FARDC signed on March 23, 2009. In November 2012, M23 took over Goma, the provincial capital of North Kivu. According to the UN expert groups, Rwanda and Uganda have supported the M23 group with weapons financed by minerals (tungsten and tantalum), smuggled across the border from mines in the eastern DRC.⁴⁷ Since the beginning of the rebellion 500,000 people have been displaced.⁴⁸

In May 2013, Ntaganda entered Rwanda and surrendered to the US embassy in Kigali. Ntaganda requested to be transferred to the International Criminal Court (ICC) in The Hague, which had issued a warrant for his arrest in 2006. Ntaganda surrendered after losing control over M23 to a rival faction.

To sum up, the modern history of the DRC is characterized by repeated outbreaks of violence and lingering conflict between numerous stakeholders, ranging from the state and the national army, to various ethnic groups, rival militias and neighboring countries. The lack of national cohesion at the time that the DRC

46 This idea was made public in the Nairobi Communiqué, a DRC-Rwanda statement on joint military engagement in the event hostilities fail to cease.

47 Agshin Mehdiyev, 'Letter Dated 26 June 2012 from the Chair of the Security Council Committee Established Pursuant to Resolution 1533 (2004) Concerning the Democratic Republic of the Congo Addressed to the President of the Security Council,' June 26, 2012, http://www.un.org/ga/search/view_doc.asp?symbol=S/2012/348/Add.1.

48 BBC, 'UN to Target DR Congo Rebel Group,' *BBC*, October 19, 2012, sec. Africa, <http://www.bbc.co.uk/news/world-africa-20013725>.

gained independence from Belgium and the thirty-two-year rule of Mobutu contributed to the decline of the nation-state. Degradation of transport and communication infrastructure and the effective disappearance of a conventional administration and justice system rendered the DRC in essence a failed state. The cross-border impact of the 1994 genocide in Rwanda ignited the conflict in the DRC (then Zaire), which became highly internationalized. The Second Congo War was the deadliest war in modern African history and directly involved eight African nations, as well as about 25 armed groups.

The conflict still continues today and the end of violence in the DRC is not in sight, with militias and soldiers being regularly involved in massive human rights abuses against civilians, including sexual violence. The ongoing instability hampers economic development. The human cost of the conflict has been unprecedented. For these reasons, the crisis in the DRC has been one of the worst humanitarian crises in history.

3 Coltan mining in the DRC

This chapter gives an overview of coltan mining in the DRC. It starts with a discussion of tantalum resources in the DRC and tantalum mining in the period before the First Congo War. Next, it discusses the first coltan boom of the early 2000s, and the second coltan boom of 2006-2010. It then focuses on the practical organization of coltan mining and trading in the DRC.

3.1 Coltan and tantalum resources in the DRC

Tantalite was first discovered in the Congo in 1910.⁴⁹ The country has substantial resources of tantalum-bearing ores, of which coltan is the most common. The main coltan deposits are located in the eastern part of the country, in particular in North and South Kivu provinces (see Figure 8). These are typically in easily-mined alluvial or soft-rock deposits, which makes them suitable for artisanal mining. In 2009 there were 23 coltan mining sites in the eastern DRC: 14 in the North Kivu province and 9 in the South Kivu province.⁵⁰ The other important source of tantalum in the DRC are the hard-rock tin-tantalum deposits in the Katanga province.⁵¹

Precise data on artisanal mining employment in the DRC are not available but it was estimated that coltan mining and trade employed around 300,000 in the DRC in 2009. More generally, it has been estimated that artisanal mining (including that of other minerals) supports up to 16% of DRC's population.⁵²

Some studies claim that the DRC's tantalum resources account for more than 60% of global resources. While this claim was effective in drawing public attention to coltan and its role in the conflict in the DRC, it does not stand up to

49 Nest, Michael, *Coltan*, Polity Press, 2011, p.36.

50 Nest, Michael, *Coltan*, Polity Press, 2011, p.36

51 *Ibid.*, p.4

52 Nest, Michael, *Coltan*, Polity Press, 2011, p.37

scrutiny. Based on the results of earlier geological exploration, Burt estimated the most likely resources of tantalum in the DRC at 55 million pounds of Ta_2O_5 .⁵³ This translates into 8% of the world's resource base. While this number indicates the presence of significant resources in the DRC, these are far behind the tantalum resources of Brazil and Australia, which together account for about 60% of the most likely resources (see Chapter 1).

3.2 Tantalum mining before the First Congo War

Before 1990s, tantalum was extracted mainly as a by-product of tin mining. Tin is extracted from cassiterite (tin oxide mineral) which is often found along coltan deposits. The principal producer was the Belgian-Zairian company *Société Minière et Industrielle du Kivu* (SOMINKI), which was formed in 1976 by Belgian mining firms and the Government of Zaire. It owned extensive mining concessions in eastern Congo and was a large producer of gold and tin.⁵⁴ As tantalum was extracted mainly as a by-product, the country's tantalum production was limited. The share of coltan in SOMINKI's total output by value was negligible compared with gold and cassiterite mining.⁵⁵

The troubles in Zaire in the 1980s caused economic difficulties for the company and the crash of tin prices in 1985 led SOMINKI to close some of its industrial mines in eastern Congo. In response, SOMINKI decided to let individual miners engage in artisanal mining on its concessions. Some of the laid-off workers became artisanal miners.⁵⁶ In 1991, Congo's production reached 57 tonnes of coltan concentrate or 16 tonnes of tantalum content.⁵⁷ However, the decline of state institutions and the deterioration of infrastructure under the rule of Mobutu led to a sharp fall in production. In 1995 it dropped to just 1 tonne. In the same year, the Belgian shareholders of SOMINKI sold their shares to a Canadian

53 Burt, Richard, Tantalum – a rare metal in abundance? T.I.C. Bulletin, No.141, March 2010. This estimate exclude the Manono mine in Katanga province.

54 Tegera, A., M. Sofia and D.Johnson, 'The Coltan Phenomenon: How a rare mineral has changed the life of the population of war-torn North Kivu province in the East of the Democratic Republic of Congo', Pole Institute, 2002

55 Ibid, p.6

56 Pourtier, Roland. The Mining Economy in the Kivu and Its Regional Implications: Report Following a Mission to North Kivu, South Kivu and Rwanda 17 April-9 May 2004. INICA, 2004. <http://archive.niza.nl/docs/200603061614031069.pdf>.

57 USGS

company, Barno.⁵⁸ With the beginning of the First Congo war in 1996 industrial mining of tantalum ceased completely (see Figure 11).

3.3 The first coltan mining boom

After having completely ceased during the First Congo War, coltan mining in the DRC suddenly boomed in 2000. The tantalum price spike of 2000-2001 acted as an adrenalin shot for coltan mining in the DRC. Prices started to rise rapidly in June 2000 and reached a peak in early 2001; over this short period of time they increased by more than a factor of six (see Figure 6). The price surge caused a massive expansion of artisanal mining in the DRC. Figure 11 shows how tantalum production in the DRC increased from practically nothing between 1996-1999 to 130 tonnes in 2000. In that year, the DRC accounted for 12% of world's primary production of tantalum.

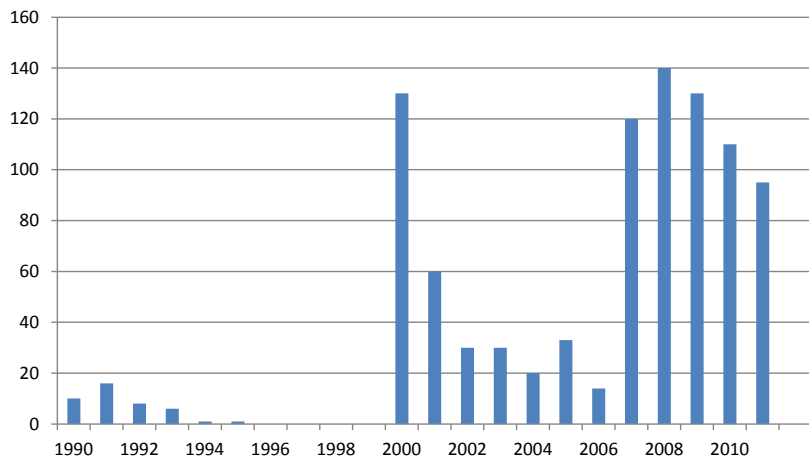


FIGURE 11: TANTALUM PRODUCTION IN THE DRC (IN TONNES OF TANTALUM CONTENT)
(BASED ON USGS DATA)

58 Willum, B., *Foreign Aid to Rwanda: Purely Beneficial or Contributing to War?* Dissertation, University of Copenhagen, 2001, p.41

Coltan caught the imagination of the Congolese people. Thousands of Congolese were drawn to coltan mines by stories of miners rapidly getting rich. In short, eastern DRC developed ‘coltan fever’.⁵⁹ This fever had striking resemblances to various gold rushes of the 19th century and had a significant impact on the functioning of society.

Interviews with miners conducted by the Pole Institute in the early 2000s show that despite the high risks (low physical safety in mines due to landslides and collapsing mine walls; insecurity created by armed rebel groups and criminals), coltan mining was viewed as a more attractive activity than agriculture.⁶⁰ Coltan mining also became more profitable than mining other minerals, such as gold or diamonds. As a result there was a mass exodus of people to coltan mining sites. The enormous expansion of coltan mining also brought substantial money to eastern Congo. A local chief commented:

‘Coltan has at least solved the unemployment problem. That has significantly reduced theft. Also many young fighters have turned into coltan miners. That also reduces their number and that of murders. Having said this, there is more money and so the price of foodstuffs has risen.’⁶¹

Even children were caught in this fever. Many of them saw coltan mining as much more promising use of their time than schooling. Thousands of children, sometimes barely older than twelve, worked in mines. A teacher interviewed in 2000 lamented:

‘We are witnessing the emptying of schools. More than 30% of our children drop out of school to mine coltan. Teachers also leave school to mine coltan.’⁶²

59 Nest, Michael, *Coltan*, Polity Press, 2011, p.36

60 Tegera, A., M. Sofia and D.Johnson, ‘The Coltan Phenomenon: How a rare mineral has changed the life of the population of war-torn North Kivu province in the East of the Democratic Republic of Congo’, Pole Institute, 2002

61 *Ibid.*, p.14

62 *Ibid.*, p.15

It is remarkable how quickly coltan production in the DRC reacted to the tantalum price boom. This increase in mining took place in a country ravaged by war and lacking essential infrastructure, without any centralized government decision-making and coordination. Congolese people were able to increase production manyfold in an extremely short period of time⁶³ despite being located thousand kilometers away from main processors of tantalum and often not knowing much about the metal and its various applications. While this fact tends to be underappreciated in the literature, it shows the large power of market signals under even the most difficult circumstances.

The boom was very short-lived, however. Prices started to fall rapidly in early 2001 and by August 2001 they crashed to approximately the same level as in 1999 and early 2000, i.e. to their pre-boom level.⁶⁴ The price collapse had a direct impact on profitability and attractiveness of artisanal mining of coltan in the DRC. Many miners went back to agriculture or moved to other sites to mine cassiterite and other minerals. Others started to treat coltan mining as a seasonal activity, which they would do during the months of low agricultural production.⁶⁵ In 2002, the total coltan production in the DRC dropped by more than 50% compared to the previous year. The total revenue from coltan mining and trading activities declined by at least a factor of 10.

3.4 The second coltan boom

Coltan production in the DRC continued to decline for several years after the end of the first coltan boom in 2001. In 2006 it accounted for just 1.6% of global primary tantalum production. 2007, however, marked the beginning of the second coltan boom in the DRC (see Figure 11). In that year tantalum production in the DRC jumped close to levels seen during the first boom in 2000. The second production boom lasted longer than the first one. In 2010 the DRC's share of global tantalum production rose to approximately 20%, much more than in the first boom of 2000-2001. In 2009-2010, the DRC was believed to be the second largest producer of tantalum after Brazil.

63 It typically takes several years to bring a known mineral deposit into production for industrial mining companies.

64 Willum, B., *Foreign Aid to Rwanda: Purely Beneficial or Contributing to War?* Dissertation, University of Copenhagen, 2001, p.47

65 *The Kivus: The Forgotten Crucible of the Congo Conflict.*

The second coltan boom in the DRC was, to a large extent, driven by increasing prices for tantalum. Although these price increases were more modest than during the 2000 boom, they were still substantial enough to stimulate artisanal production. As was mentioned before, artisanal mining is very flexible and can react quickly to price incentives, typically much faster than industrial mining. Figure 12 illustrates that tantalum production in the DRC has positively correlated with tantalum prices over the last decade.

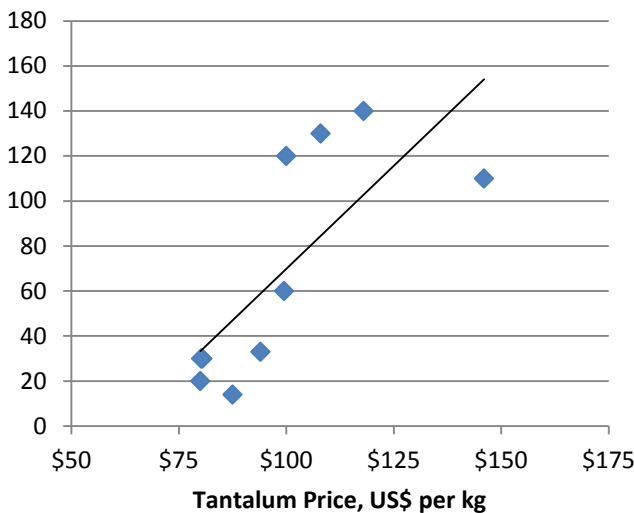


FIGURE 12: TANTALUM PRICE AND PRODUCTION (IN TONNES) IN THE DRC, 2001-2010
(BASED ON USGS DATA)

Figure 13 shows how Africa's share in global production increased while Australia's share decreased. It can be concluded that coltan mining in the DRC substituted a large part of Australian tantalum mining. Indeed, Talison Minerals Pty (now known as Global Advanced Minerals) blamed cheap coltan from Central Africa for having to shut down its mines.⁶⁶ Talison finally decided to resume production in 2011, only after tantalum prices strengthened substantially again.⁶⁷

⁶⁶ Nest, Michael, *Coltan*, Polity Press, 2011, p.27

⁶⁷ Global Advanced Metals, 'World's largest tantalum producer resumes operations', January 17, 2011 <http://globaladvancedmetals.com/news/announcements/2011/january/world%E2%80%99s-largest-tantalum-producer-resumes-operations.aspx>, accessed December 17, 2012.

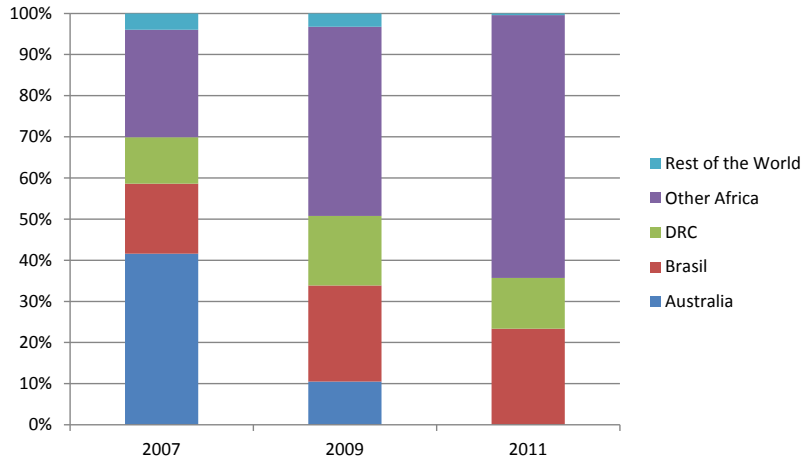


FIGURE 13: GEOGRAPHIC DISTRIBUTION OF TANTALUM PRODUCTION, 2007-2011

3.5 Organization of coltan mining and trading during the booms

Coltan mining in the eastern DRC in the early 2000s was done exclusively on an artisanal basis. Artisanal mining refers to mining by individuals and groups with minimal or no mechanization, often informally or illegally (see Chapter 1). Artisanal mining is often assumed to be synonymous with small-scale mining. However, this does not always have to be the case. The Basie mine in North Kivu employed at one point no less than 13,000 workers and was the largest cassiterite mine in the DRC, accounting for around 70% of all cassiterite exports from North Kivu and also some coltan.⁶⁸

Mining

Despite its informal nature, artisanal mining in the DRC 'is often meticulously organized on the micro-level, governed by multiple rule systems transcending statutory and customary spheres.'⁶⁹ The first step in the mining process is selecting a mining site (prospecting). This step requires some expertise and

68 Zingg Wimmer, S. and F Hilgert, 'Basie. A one-year snapshot of the DRC's principal cassiterite mine', IPIS, November 2011, http://www.ipisresearch.be/att/20111128__Basie_FHilgert_SZingg.pdf

69 Garrett, Nicholas. 'Observations from the DRC.' *African Analyst*, 1/2008. http://www.resourceglobal.co.uk/documents/Garrett_Af_An_Feb_2008.pdf.

experience, and is often done by former employees of industrial mining companies, in particular SOMINKI. If the site looks promising, the digger-pro prospector tries to get permission from landowner and the local chief, who has customary rights to the land, in exchange of an agreed share of production. If the negotiations are successful, the prospector puts together a team of diggers and development can start.⁷⁰

Diggers, known in Congolese French as *creuseurs*, work in teams of three to six, and they typically split their proceeds equally. In large mines with hundreds of miners there is more specialization of labor, with workers specializing in constructing the woodwork supports, clearing the mining sites of soil and rocks, supervisors, etc. The access to a mine and the production process is controlled by a mine manager often known as *chef de coline*, who represents the owner of the mine or an armed group controlling it.⁷¹

A few publications reported that some mines use forced labor. This has apparently taken place occasionally but it is unlikely to have been a widespread practice since there is a sufficient supply of artisanal miners. Mining is still considered as more attractive than many other occupations in the DRC and therefore there is little need to coerce people to work in mines.

Trading

Small traders, or *petits negociants* in Congolese French, visit mines, buy coltan and transport it using porters to a nearby village. Porters carry the ore in bags over tens of kilometers, in difficult terrain and in hot and humid climate. Bigger traders, or *gros negociants*, consolidate coltan bought from *petits negociants* and organize its transportation to main trading centers in eastern DRC – the cities of Goma and Bukavu. This transportation is often done by small aircraft.

In Goma and Bukavu ore is bought by a *comptoir*, a mineral trading firm. *Comptoirs* use electronic scales and analyzing equipment to determine tantalum content in the ore and hence its appropriate price. Sometimes they also conduct preliminary processing to increase the concentration of tantalite by removing

70 Garrett, Nicholas. *Walikale. Artisanal Cassiterite Mining and Trade in North Kivu - Implications for Poverty Reduction and Security*. Washington D.C.: Communities and Small-Scale Mining, 2008, p.37

71 Nest, Michael, *Coltan*, Polity Press, 2011, p.40

impurities. Most *comptoirs* are foreign owned and typically have close ties with major processors of tantalite such as H.C. Starck and Cabot. *Comptoirs* often provide financing to *negociants* or acquire mining concessions directly. At the next step, they organize exports of coltan and other minerals from the DRC.

Rwanda is the preferred trade route for exporting coltan from eastern Congo for several reasons. Exports of tantalum concentrates are taxed by the DRC but are not taxed by Rwanda. Therefore, there is a clear economic incentive to smuggle coltan to Rwanda rather than export it legally from the DRC. Imported minerals can be declared as minerals produced in Rwanda if they undergo further processing that adds 30% to their value.⁷² Rwanda also has the best transport connection with eastern Congo. As a result, a significant amount of coltan exported from Rwanda is likely to be of Congolese origin.⁷³ Figure 14 illustrates that since 1999 reported production numbers in DR Congo and Rwanda moved very closely together. This might be an indirect indication of 'leakage' of Congolese coltan to Rwanda.

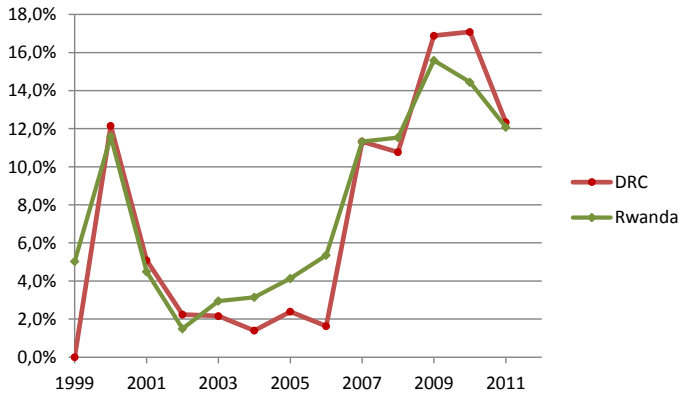


Figure 14: Share of the DRC and Rwanda in global production of tantalum
(Based on USGS data)

72 Bleischwitz, Raimund, Monika Dittrich, and Chiara Pierdicca. 'Coltan from Central Africa, International Trade and Implications for Any Certification.' *Resources Policy* 37, no. 1 (March 2012): 19–29. This is quite common rule in many countries.

73 Nest, Michael, *Coltan*, Polity Press, 2011, p.23

Revenue across the supply chain

Table 2 show the distribution of revenue from coltan exports among different actors across the supply chain in the DRC. The activities of miners and chiefs of mines account only for 27% of the total export value.⁷⁴ The remaining revenue is distributed between traders and various armed groups.

STAGES IN THE SUPPLY CHAIN	ACTORS IN THE SUPPLY CHAIN	SHARE OF REVENUE, %
Mining	Miners (team of creuseurs)	17
	Chief of mine	10
Trading	Petits negociants	10
	Gros negociants	13
	Comptoir	10
	Taxes to RCD-Goma	7
	Other licenses and fees	22
	Armed groups	11
	Export price in the DRC	100%

TABLE 2: DISTRIBUTION OF COLTAN REVENUE, C. 2000

(BASED ON NEST, 2011, TABLE 2.1)

Many mines operate as a barter economy, where workers retain a fixed percentage of the coltan they produce. At these mines coltan replaces money in most transactions including the purchasing of food supplies, tools and services, i.e. it serves as a medium of exchange. Porters, like miners are also often paid in coltan. In some mines, *creuseurs* are getting paid per kilogram of coltan they produce.

Annual income of artisanal coltan and cassiterite miners in North and South Kivu provinces has been estimated at US\$800. This is relatively low, especially compared to an income of circa US\$2,500 per year in the diamond fields of Kasai Occidental and Kasai Oriental provinces and of US\$2,200 per year in the copper

⁷⁴ Similar share – slightly more than 30% – was obtained for cassiterite mining in eastern DRC. See Garrett, Nicholas. 'Observations from the DRC.' *African Analyst*, 1/2008

belt of Katanga Province.⁷⁵ These estimates, however, are very approximate. For example, it was reported that the cassiterite *creusers* can earn up US\$100 on a productive day. However, when adjusted for the high cost of food at mining sites (since all food has to be delivered by foot over large distances), it rarely exceeds on average US\$5 per day in real terms.⁷⁶

75 de Koning, Ruben. Artisanal Mining and Post-conflict Reconstruction in the Democratic Republic of the Congo, SIPRI Background Paper. October 2009. <http://books.sipri.org/files/misc/SIPRIBP0910b.pdf> .

76 Garrett, Nicholas. Walikale. Artisanal Cassiterite Mining and Trade in North Kivu - Implications for Poverty Reduction and Security. Washington D.C.: Communities and Small-Scale Mining, 2008, p.42

4 Coltán's connections to the conflict in the DRC

The goal of this chapter is to examine the connection between coltan mining and violence in the DRC. A better understanding of the role of coltan in the Congo conflicts is essential to assess the effectiveness of policy initiatives aimed at reducing the violence associated with conflict minerals (see chapter 5). The chapter analyzes the role of coltan during the First and Second Congo Wars and the Kivu Conflict in Eastern Congo. It describes how armed groups use the mining and trading of coltan to finance their activities. This chapter also discusses some issues related to the motivation of armed groups engaged in coltan mining and in particular the debate on causes of civil conflict – 'greed versus grievances'. The analysis underlines some important nuances to the widely held views that coltan is the root cause of conflict in the DRC.

4.1 Coltan as a conflict mineral

In the minds of many people the importance of coltan is mostly related to its contribution to devastating conflict in the DRC, where it often thought to have provided the motivation and means for numerous armed groups to engage in violence. This connection has made coltan almost a household name. It was listed as one of the DRC's conflict minerals along with tin, tungsten and gold. However, the connection between coltan and the conflict in the DRC is not as simple and straightforward as it is sometimes presented. This relationship has not been static but has developed alongside the broader evolution of the conflict.

It should be stated from the outset that, overall, coltan has been of minor importance during the conflict, except for brief periods during the tantalum price booms. Other minerals mined in eastern Congo have generated substantially higher revenues than coltan. After the end of the first coltan boom in 2001, many artisanal miners abandoned coltan mining and coltan production and exports dropped sharply. The main result was that coltan mining and trading

have become only of marginal importance as a source of revenue for armed groups compared other minerals and especially to cassiterite.⁷⁷

Evidence from the Enough Project, which mainly relied on data from official Congolese sources but adjusted them for underreporting, shows that in 2008 coltan accounted only for 6% of estimated profits captured by armed groups from trade in conflict minerals originating in the Kivu provinces (see Figure 15). Our focus on coltan is related more to the notoriety that coltan received in the public debate rather than on its economic importance. In addition, most considerations related to the role of coltan in the conflict have direct relevance for other conflict minerals.

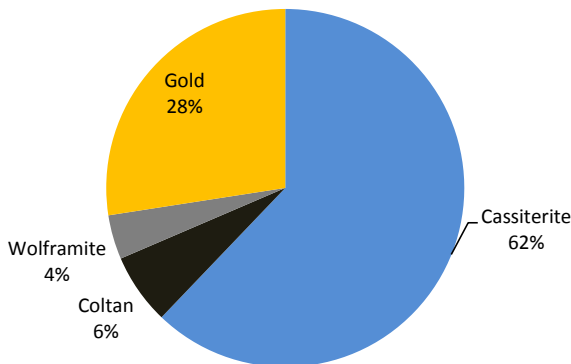


FIGURE 15: DISTRIBUTION OF ARMED GROUPS' ESTIMATED PROFITS FROM TRADE IN 4 MAJOR MINERALS, 2008

[SOURCE: ENOUGH PROJECT, A COMPREHENSIVE APPROACH TO CONGO'S CONFLICT MINERALS, APRIL 2009]

77 "Faced With a Gun, What Can You Do?" *War and the Militarisation of Mining in Eastern Congo*. (Global Witness, July 2009), <http://www.globalwitness.org/library/global-witness-report-faced-gun-what-can-you-do>.

4.2 The use of conflict minerals by armed groups

Armed groups have used a variety of methods to profit from minerals, including coltan. Some methods rely on the use of force or the threat of force to gain access to mineral deposits and to mine the ore. Other methods rely on free exchange, typically through control of mines or trade intermediaries (the obvious question with regard to the situation in eastern DRC is whether control of assets is itself legal). Most of the time, force has been an essential element in capturing economic benefits from minerals. Forced labor, pillaging, various taxes, obligatory fees and protection payments, monopoly on exports – all these methods have been used by one or various armed groups. An important point is that these methods cover all steps within the Congolese value chain – from a mine to exports. The prolonged conflict in the DRC increased the need for funding.

First Congo War

There is a general consensus that the First Congo War was driven by security and political concerns, in particular by the inability and unwillingness of Mobutu to deal with various armed groups based on the Congolese territory that were attacking targets in neighboring countries. At that time coltan production in the DRC was close to zero (Figure 11) and coltan was not a material source of finance for any side.

Although coltan was clearly not the main cause of the outbreak of the First Congo War, this does not mean that the role of other minerals can be ruled out as an influence. Even before the AFDL took power in Kinshasa, it started to award lucrative mineral deals (not involving coltan) to foreign companies in exchange for cash down payments amounting to an estimated US\$70 million.⁷⁸ This cash proved to be very important in funding the AFDL's military efforts especially at the final stages of the First Congo war. This type of conflict financing, the sale of 'booty futures', i.e. exploitation rights to natural resources that combatants only hope to capture in battle, has unfortunately been quite common in Africa.⁷⁹ In the subsequent stages of the conflict in the DRC the reliance on minerals as source of funding has only increased.

78 Stearns, Jason. *Dancing in the Glory of Monsters. Collapse of the Congo and the Great War of Africa*. New York: Public Affairs, 2012., p.287

79 Ross, Michael. 'Booty Futures,' May 2005. <http://www.sscnet.ucla.edu/polisci/faculty/ross/bootyfutures.pdf>.

Second Congo War

Since the beginning of the Second Congo War, the power in the Kivu provinces had been in the hands of the *Rassemblement Congolais pour la Démocratie* (RCD), the Rwandan- and Ugandan-backed rebel group. This group and its Rwandan sponsors became the most significant actors in coltan mining and trading in eastern Congo. In the initial stage of the Second Congo War, between November 1998 and April 1999, the RCD and the Rwandan army looted 1,000 – 1,500 tonnes of coltan from stockpiles in eastern DRC that belonged to SOMINKI and moved them to the Rwandan capital, Kigali.⁸⁰ The armed groups also generated revenues from setting up illegal taxes and fees and from 'gate keeping' at mining locations. For example, the RCD made every trading house (*comptoir*) pay US\$ 15,000 for a yearly license, and collected taxes on mineral exports, estimated at 8% of the total export value.

As the prices of tantalum started to raise in the year 2000, the RCD tried to exploit the boom by creating a new trading company, SOMIGL (*Société Minière des Grands Lacs*), and granting it an export monopoly on all coltan produced in RCD-controlled territory. Additionally, a new tax of US\$ 10 per kilogram of coltan exported from RCD territory was imposed.⁸¹ The tantalum price boom helped to increase the financial means available to the RCD. According to interviews, in 2000, the RCD rebel government raised up to US\$ 1 million per month for exporting 100-150 tonnes of coltan vs. US\$ 200,000 per month for exporting diamonds.⁸²

The period when coltan brought substantial revenues to armed groups was short-lived, however. Many *negociants* refused to accept the lower prices offered by SOMIGL. It led to the establishment of a black market in coltan and the smuggling of coltan out of the DRC, which eventually undermined the purpose for which the SOMIGL was created. Then, in early 2001, tantalite prices started to collapse. The price drop meant the end of SOMIGL, which was abolished in March 2001.

80 Report of the Panel of Experts on the Illegal Exploitation of Natural Resources and Other Forms of Wealth of the Democratic Republic of the Congo (United Nations, April 2001), <http://www.un.org/News/dh/latest/drcongo.htm>.

81 Jeroen Cuvelier and Tim Raeymaekers, *Supporting the War Economy in the DRC: European companies and the coltan trade*.

82 Karen Hayes and Richard Burge, *Coltan Mining in the Democratic Republic of Congo: How tantalum-using industries can commit to the reconstruction of the DRC*.

In addition to backing the RCD rebels, Rwanda also played a more direct role in coltan exploitation, especially through the activities undertaken by the Rwandan Patriotic Army (RPA). The army provided protection to the miners and companies extracting coltan in exchange for sharing their profits. During the coltan boom, Rwanda even moved prisoners to the Congo, and used them for mining coltan in exchange for reduced sentences and small cash allowances. According to the UN Group of Experts, the Rwandan government set up a 'Congo Desk' within the RPA's External Relations Department, which was tasked with overseeing the mining of Congolese resources and facilitating trade with Western companies. Coltan mined in the DRC was often transported to Rwanda's capital Kigali with RPA helicopters. The RPA was closely involved in the operations of companies that were buying and exporting coltan, such as Rwanda Metals and Grands Lacs Metals.⁸³ It was estimated that the RCD and Rwandan army together pocketed approximately US\$ 10 million of profit from coltan mining.⁸⁴

Other armed groups besides the RCD and the Rwandan and Ugandan armies also benefited or tried to benefit from mineral resources. In the early 2000s, coltan mines in the provinces of North and South Kivu were also controlled by Congolese Mai-Mai groups and Rwandan Hutu rebel groups (see Table 3).⁸⁵ Table 3 also shows that coltan was only one of the various sources of mineral revenue for the armed groups.

83 Report of the Panel of Experts on the Illegal Exploitation of Natural Resources and Other Forms of Wealth of the Democratic Republic of the Congo [United Nations, April 2001], <http://www.un.org/News/dh/latest/drcongo.htm>.

84 Nest, Michael, *Coltan*, Polity Press, 2011, Table 3.3, p.94

85 Nest, Michael, *Coltan*, Polity Press, 2011, p.85

ARMED GROUP	MINERALS						
	Coltan	Gold	Tin	Tungsten	Diamonds	Copper	Cobalt
Pro-government forces							
DRC army					✓	✓	✓
Zimbabwean army					✓		
Angolan army					✓		
Mai Mai	✓	✓	✓		✓		
Anti-government forces							
Rwandan army	✓	✓	✓	✓	✓		
Ugandan army	✓	✓	✓	✓	✓		
RCD-Goma	✓	✓	✓	✓	✓		
RCD-ML	✓	✓	✓	✓	✓		
MLC	✓	✓			✓		

TABLE 3: MAJOR ARMED GROUPS AND SOURCES OF MINERAL REVENUE, 1998-2003
(SOURCE: NEST, 2011)

Competition over the control of the coltan mines often led to violent confrontations between the different armed actors. The number of clashes between the Rwandan army and the Mai-Mai intensified during the coltan boom between May and December 2000. Some of Rwanda's attacks directly targeted coltan mines with the aim of capturing stocks of mined coltan.⁸⁶ Clashes over coltan and gold also took place between the Mai-Mai, the Ugandan army and the MLC rebel group in the Ituri district of Province Orientale.⁸⁷

86 Addendum to the report of the Panel of Experts on the Illegal Exploitation of Natural Resources and Other Forms of Wealth of the Democratic Republic of the Congo (United Nations, November 2001), <http://www.unhchr.ch/Huridocda/Huridoca.nsf/%28Symbol%29/S.2001.1072.En?Opendocument>.

87 Report of the Panel of Experts on the Illegal Exploitation of Natural Resources and Other Forms of Wealth of the Democratic Republic of the Congo.

Kivu Conflict

Studies show that armed groups continue to profit from minerals in eastern DRC during the current stage of the conflict. Table 4 shows that coltan remained one of various sources of mineral revenue of the armed groups between 2006 and 2008. According to a study in 2009 by IPIS, a Belgian research center, slightly more than 50% of mining sites in North and South Kivus were controlled by armed groups.⁸⁸ The Congolese army, FARDC, is also involved in the illegal exploitation of natural resources.

ARMED GROUP	MINERALS							
	Coltan	Gold	Tin	Tungsten	Manganese	Diamonds	Copper	Cobalt
DRC army (FARDC)	✓	✓	✓	✓	✓	✓	✓	✓
Mai Mai	✓	✓	✓			✓		
PARECO	✓	✓	✓					
FDLR	✓	✓	✓	✓				
CNDP	✓	✓	✓		✓			

TABLE 4: MAJOR ARMED GROUPS AND SOURCES OF MINERAL REVENUE 2006-2008

(SOURCE: NEST, 2011)

Additional information on the recent involvement of armed groups in mineral exploitation and trading in eastern Congo is given in the next Chapter.

4.3 Motivations of armed groups

There is substantial debate in the literature over the role of minerals, including coltan, in the conflict in eastern Congo. Several organizations and authors view the exploitation of natural resources as a structural cause of the conflict in the DRC and the main motivation for armed groups.⁸⁹ For example, a report by Global Witness states that 'greed, and the desire to control eastern DRC's rich

88 Spittaels, Steven and Filip Hilger. Accompanying Note on the Interactive Map of Militarised Mining Areas in the Kivus. Antwerp, Belgium: IPIS, August 2009.

89 These include advocacy groups such as 'Global Witness' and 'Enough'

mineral deposits' is the primary motivation behind the war there.⁹⁰ However, many analysts disagree with the notion that the exploitation of natural resources is the root cause of the conflict. Rather, it is argued that armed groups use trade in minerals to finance their activities, which enables the groups to survive, and thus minerals fuel and protract the conflict.⁹¹

In the case of such a complex and prolonged conflict as in the DRC, it is not easy to determine whether trade in minerals serves merely as an instrument to reach political objectives or whether profiteering is a dominant goal on its own. The motivations of different armed groups cannot be observed directly. There is always a large number of interrelated and dynamic factors that affect the decision-making of such groups. Disentangling and weighting the relative importance of such factors is an intricate task. A related academic debate on 'greed versus grievance' as causes of conflict has not been settled either.

90 "Faced With a Gun, What Can You Do?" *War and the Militarisation of Mining in Eastern Congo*. (Global Witness, July 2009), p.15, <http://www.globalwitness.org/library/global-witness-report-faced-gun-what-can-you-do>.

91 This stream is represented for instance in the following publications: Steven Spittaels and Filip Hilgert, 'Are Congo's mines the main target of the armed groups on its soil?'; Harrison Mitchell and Nicholas Garrett, *Beyond Conflict: Reconfiguring approaches to the regional trade in minerals from Eastern DRC*; Louise Anten, *Strengthening governance in a post-conflict district of the Democratic Republic of Congo: a study of Ituri*; Dominic Johnson, *Who's In Charge? Putting the Mineral Trade in Eastern DRC under International Control: An Overview* (Pole Institute, August 2010), <http://www.pole-institute.org/documents/pole-mines-En%5B1%5D.pdf>; Ruben de Koning, *Artisanal mining and postconflict reconstruction in the Democratic Republic of the Congo*, SIPRI Background Paper (Stockholm International Peace Research Institute, October 2009), <http://books.sipri.org/files/misc/SIPRIBP0910b.pdf>; Ruben de Koning, *Controlling Conflict Resources in the Democratic Republic of the Congo*, SIPRI Policy Brief (Stockholm International Peace Research Institute, July 2010), <http://books.sipri.org/files/misc/SIPRIBP1007.pdf>.

Greed versus grievance debate

The debate on 'greed versus grievance' refers to two contending theories on the causes of civil wars and rebellions. The 'greed' theory suggests that combatants in civil wars are motivated by economic considerations, i.e. by opportunities for looting, making them indistinguishable from bandits and criminals. The 'grievance' theory assumes that issues of identity, e.g. ethnicity, religion, social class, etc., and discrimination are the main motivators for armed conflict.

The debate was initiated by a series of influential studies by Paul Collier and Anke Hoeffler that statistically examined the relationship between civil war and quantitative indicators of grievance. They found that indicators of grievance, such as inequality, political oppression, and ethnic and religious divisions, were not closely associated with a higher risk of civil war. At the same time, primary commodity exports and other economic variables were found to have stronger explanatory power. They concluded that 'factors which determine the financial and military viability of a rebellion are more important than objective grounds for grievance.'⁹²

This conclusion, which contradicted most of the existing political science literature, proved to be controversial, and led to many critical responses.⁹³ Other researchers using different datasets have found that oil dependence indeed increased the risk of conflict but failed to establish such a relationship for primary commodities in general. Other lootable resources, such as gemstones and drugs, have been found to lengthen existing conflict rather than make conflict more likely to begin.⁹⁴ These studies do not address the issue of causality. It may be that causality runs in the opposite direction: higher risk of conflict or political instability drives out manufacturing firms, which are less tied to a specific location than mining firms, therefore increasing a country's dependence on natural resources. Another option is

92 Collier, Paul, and Anke Hoeffler. "Greed and Grievance in Civil Wars." *Oxford Economic Papers*, 56 (2004): 563–595.

93 For example: Nathan, Laurie. *The Frightful Inadequacy of Most of the Statistics: A Critique of Collier and Hoeffler on Causes of Civil War*. Discussion Paper No.11. Crisis States Research Centre, September 2005. <http://eprints.lse.ac.uk/28337/1/dp11.pdf>.

94 Ross, Michae L. "What Do We Know About Natural Resources and Civil War?" *Journal of Peace Research* 41, no. 3 (2004): 337–356.

that both civil war and resource dependence may be independently caused by some unaccounted third variable, such as weak institutions.

However, in recent years there has been some convergence between these two theories. Proponents of each agree that both 'greed' and 'grievance' factors play a role in conflict. Having conducted a thorough review of existing literature on conflict and security, the World Bank, which is often associated with the 'greed' theory,⁹⁵ recently concluded in its World Development Report: 'explanations for conflict based purely on economic motives are inadequate.'⁹⁶ The report continued:

'The attention in recent years to quantitative correlations between economic factors and conflict has led some to argue that economics is *all* that counts. Not only is this facile – it misrepresents the state of research. It is much more difficult to test the importance of identity, ideology, injustice, and political motivation using statistical methods, but current research suggests that these are very important in explaining violence and conflict.'⁹⁷

Interestingly, the expert groups on the DRC assembled by the UN, whose reports were instrumental in raising awareness on the role of minerals in Congo's conflict, came to differing conclusions with regard to the motivation of armed groups in eastern DRC in recent years. In 2001 the Panel of Experts stated that '[t]he conflict in the Democratic Republic of the Congo has become mainly about access, control and trade of five key mineral resources: coltan, diamonds, copper, cobalt and gold.'⁹⁸ However, in 2010 the Group of Experts concluded that

95 This is due to the fact that Paul Collier worked for the World Bank when he put forward the 'greed' theory.

96 World Bank. World Development Report 2011: Conflict, Security, and Development. Washington DC: World Bank, 2011.,p.81

97 Ibid., p.81

98 'Report of the Panel of Experts on the Illegal Exploitation of Natural Resources and Other Forms of Wealth of the Democratic Republic of the Congo.' United Nations, April 2001.

'exploitation of natural resources merely enables armed movements to sustain their efforts towards political objectives.'⁹⁹

We tend to agree with the latter conclusion and believe that in most cases armed groups' involvement in mineral mining and trading in eastern DRC is a symptom rather than the root cause of the problem. First, it is difficult to deny that various grievances (access to land, citizenship issues, security threats in neighboring states, etc.) and consequently political and security goals were at the origin of the initial outbreak of conflict. Second, such a protracted and deadly conflict as the one in the DRC, which has been characterized by numerous mass atrocities, generates its own grievances, and revenge and score setting become driving forces in their own right. Third, if the presence of mineral resources is the main motivation for violence in the Kivu provinces, then why in other mineral-rich provinces in the DRC, such as Katanga or Maniema, has it been comparatively peaceful?

The geographical patterns of conflict in eastern DRC in recent years do not indicate that mineral revenue represented an all-encompassing motivation for armed groups. The Pole Institute, for instance, points out that 'If natural resource control lay at the heart of war in the DRC, the theatres of war would be those where natural resources are most lucrative, but this is not the case.'¹⁰⁰ IPIS also states that the armed group M23 has neither taken control over mining areas nor launched operations targeting mining sites, suggesting that gaining control over minerals has not been a priority for this armed group.¹⁰¹

Finally, for some armed groups minerals were not the largest source of revenues. For example, the CNDP (Tutsi-based group backed by the Rwanda; it was

99 Group of Experts on the Democratic Republic of the Congo, *S/2010/596: Final Report 2010 of the Security Council Committee Established Pursuant to Resolution 1533 (2004) Concerning the Democratic Republic of the Congo* (United Nations, 2010), 78, http://www.un.org/ga/search/view_doc.asp?symbol=S/2010/596. However, it also added that "economic motivations are increasingly driving a significant portion of armed actors", p. 75

100 Dominic Johnson, 'Minerals and Conflict in Eastern DRC,' July 2009, <http://www.pole-institute.org/site%20web/echos/echo114.htm>.

101 IPIS, *Mapping Conflict Motives: M23* (Antwerp, Belgium: IPIS, November 2012), http://www.ipisresearch.be/publications_detail.php?id=390.

integrated into the Congolese army in 2009), derived less than 15% of its revenue from the mineral trade.¹⁰²

This illustrates the point that armed groups 'have no organic link with minerals' and will switch to exploit agriculture or other natural resources to finance their activities.¹⁰³ The 2010 UN report confirms that minerals are not the only source of revenue used by the armed groups. Other natural resources such as timber, land, fishing, poaching and charcoal are also used to fund activities of these groups, diminishing the relative importance of the mineral trade for the armed groups' survival.¹⁰⁴

At the same time, minerals have been a major (and often the main) source of revenues for many armed groups. For example, the FLDR (ethnic Hutu militia led by organizers of the 1994 Rwandan genocide) derived up to 75% of its revenues from minerals, mostly from gold, and the 85th brigade of the FARDC up to 95%.¹⁰⁵ This is because mining, and especially artisanal mining, is a war-resilient economic activity. Minerals are among the few products that can be produced in a war-ravaged country without any significant investment or sophisticated equipment. Mining is more war-resilient especially compared to manufacturing or technology-intensive services, which are easily disrupted in times of war. Mining is also more war-resilient compared to another primary economic activity – agriculture. It is more difficult to cause permanent damage to artisanal mines than to permanently destroy crops and animals. Minerals can also easily be sold on the global market for hard currency and are often easy to smuggle across borders. Furthermore, mining is also geographically concentrated, which makes it much easier to control. Taxing minerals or controlling mineral production directly were typically the easiest and the most lucrative ways for armed groups to raise revenue.

102 Nicholas Garrett and Harrison Mitchell, *Trading Conflict for Development. Utilising the Trade in Minerals in Eastern DR Cong for Development*, April 2009, 6.

103 Johnson, 'Minerals and Conflict in Eastern DRC.'

104 United Nations News Centre, 'UN News - DR Congo: UN Experts Outline Sources of Funding for Armed Rebels,' *UN News Service Section*, December 30, 2011, <http://www.un.org/apps/news/story.asp?Cr1=congo&NewsID=40865&Cr=democratic#.UlhgJ1FqCxV>.

105 Garrett, Nicholas, and Harrison Mitchell. *Trading Conflict for Development. Utilising the Trade in Minerals in Eastern DR Cong for Development*, April 2009, p.6

5 Policy initiatives

The importance of mineral resources, including coltan, in financing various armed groups in eastern DRC has led to many proposals aimed at breaking the link between minerals and the conflict. These initiatives have been advanced by NGOs, multilateral organizations, trade associations, national governments and industry. The goal of this chapter is not to provide a comprehensive listing of such initiatives or their detailed description (such information can be found elsewhere, for example in publications by the International Peace Information Service,¹⁰⁶ M.Nest,¹⁰⁷ GAO¹⁰⁸ and Resolve¹⁰⁹), but rather to highlight some of the most prominent initiatives and analyze the main challenges for their implementation. In particular, we pay close attention to the Dodd-Frank Wall Street Reform and Consumer Protection Act (Section 1502) as it is probably one of the most consequential and controversial policy initiative in this field.

5.1 Brief review of policy initiatives

There is a significant number of policy initiatives that have been proposed or put in place that have direct relevance to the coltan mining and trade in eastern DRC. The common denominator of these initiatives is the broad goal of reducing the connection between minerals and conflict. Most of the initiatives aim to diminish the opportunities for the armed groups to profit from the minerals by increasing the accountability of companies sourcing minerals from eastern DRC.

106 Didier Verbruggen, Evie Francq, and Jeroen Cuvelier. 2011. Guide to Current Mining Reform Initiatives in Eastern DRC. Antwerp: International Peace Information Service. http://www.ipisresearch.be/att/20110412_Guide_Mining_Reform_EDRC.pdf.

107 Michael, Nest. 2011. Coltan. Cambridge, UK: Polity Press

108 Conflict Minerals Disclosure Rule. SEC's Actions and Stakeholder-Developed Initiatives. 2012. Washington D.C.: U.S. Government Accountability Office. <http://www.gao.gov/assets/600/592458.pdf>.

109 Summary of In-Region Initiatives That Support Conflict-Free Minerals Sourcing. 2012. Public-Private Alliance for Responsible Minerals Trade. <http://www.resolve.org/site-ppa/files/2012/06/Summary-of-In-region-Initiatives-09.21.12.pdf>.

Nonetheless, there are also substantial differences between them. Some of them are focused specifically on eastern DRC and coltan, while others are global in nature and cover all conflict minerals or even all extractive industries. Some of them have been put forward by international organizations or governments, while others have been developed by the industry.

Initiatives focusing specifically on coltan or on conflict minerals

Coltan became notorious for its connection to violence in eastern Congo when the 2000-2001 price boom briefly made it the most important source of revenue for some rebel groups. Since then, the importance of coltan declined substantially and now it is just one of several ‘conflict minerals’ that are used by armed groups in eastern DRC to finance their activities (see chapters 3 and 4).¹¹⁰ Similar tools and approaches can be used for various minerals, and therefore many initiatives cover various conflict minerals rather than coltan only. An exception to this rule is the German government-sponsored Analytical Fingerprint (AFP) method, which draws on collaborative analytical research with the German Federal Institute for Geosciences and Natural Resources (BGR). Devised in 2006, it specifically targeted coltan production from different mines in the DRC to improve the ore’s traceability. The majority of the initiatives, however, have a broader focus than coltan alone.

An initiative that was specifically proposed to address the issue of conflict minerals is the Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas developed by the Organisation for Economic Co-operation and Development (OECD).¹¹¹ It is probably the most comprehensive of all sourcing initiatives. The Guidance was produced in close consultation with various stakeholders, including industry and Congolese authorities, and was adopted at the end of 2010. It covers all stages of the value chain and proposes a five-step approach to due diligence implementation. It also includes a special supplement with more specific

110 Gold stands out among other conflict minerals. Gold is at least two orders of magnitude more expensive per unit of weight than the other three conflict minerals. Very high price makes gold much easier to conceal and smuggle. Therefore gold might deserve a special attention in efforts to break the connection between minerals and conflict in eastern DRC.

111 Organisation for Economic Co-operation and Development. 2011. OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas. Paris: OECD Publishing.

guidelines for risk mitigation in the supply chain of tin, tantalum and tungsten. The Guidance received broad support from international organizations, governments, the private sector and NGOs. Although the Guidance is not legally binding, it is an important tool for ‘naming and shaming’ companies that do not follow its requirements. It also provides a basis for other initiatives aimed at the supply chain of conflict minerals. The Guidance was endorsed, among others, by the UN Group of Experts on the DRC in its 2010 report,¹¹² as well as by the International Conference of the Great Lakes Region in the Lusaca Declaration in December 2010.

Global initiatives covering all extractive industries

Many initiatives have a global character as they draw on approaches that could be used in any conflict-affected area. One example of such a global scheme is the Extractive Industry Transparency Initiative (EITI) that was established in 2002. It aims to increase transparency over payments made by oil and mining companies to governments. It brings together governments, companies and civil society organizations, and involves independent verification and certification. The DRC is a candidate country in the EITI. The significance of this initiative for eastern Congo is constrained by the limited activity of industrial mining companies in the area. However, foreign investment into the mining sector is expected to increase substantially once the security situation improves, and in this case the EITI will become a very important tool to improve standards of governance in eastern DRC.

In 2008 the World Bank launched the EITI++ initiative. Whereas the EITI focuses mainly on revenue transparency, EITI++ goes beyond that to cover all the stages in the natural resource value chain: from extraction to processing, managing revenue, and efficient utilization of wealth derived from natural resources. The main tool of the EITI++ is technical assistance to participating countries on such issues such as improving the quality of contracts with multinational companies, monitoring mining operations and the collection of related taxes and royalties, managing price volatility, and investing revenues effectively for national development.

112 *Final Report of the Group of Experts on the DRC, Submitted in Accordance with Paragraph 6 of Security Council Resolution 1896 (2009)*. 2010. UN Group of Experts on the Democratic Republic of the Congo. http://www.un.org/ga/search/view_doc.asp?symbol=S/2010/596, p.86

Industry initiatives

Responding to pressure from the UN, NGOs, and public opinion, industry has also developed several initiatives. The International Tin Research Institute (ITRI), a UK-based trade association, proposed the Tin Supply Chain Initiative (iTSCI) in 2009 to improve the traceability of cassiterite sourced in eastern DRC. Its practical implementation started in summer of 2010 in South Kivu. It involves documenting the flow of minerals from mines to exporters (*comptoirs*), tagging bags with minerals at mines and keeping a data recording system. After the Congolese government introduced the mining ban in 2010, the main focus of the iTSCI moved to Rwanda, where it has achieved some success.¹¹³ More recently it started to re-engage with DRC in particular in the Katanga province.

Another industry initiative has emerged as a result of collaboration between the Electronics Industry Citizenship Coalition (EICC) and the Global e-Sustainability Initiative (GESI). These two industry associations established a Conflict-Free Smelter Program in which smelters and refiners (for gold) are evaluated by an independent third party to determine whether they source minerals only from conflict-free sources. Smelters that are passed the assessment process are then certified as conflict-free.

Other categories

Other initiatives have a supporting and enabling role – they aim to develop tools and instruments that would facilitate the traceability of minerals. Such tools should help to improve effectiveness of the implementation of other sourcing initiatives.

The German Federal Institute for Geoscience and Natural Resource (BGR) developed a system called Certified Trading Chains (CTC) which draws on the results of their Analytical Fingerprint (AFP) analysis (see above) which has been expanded from coltan alone to cover tin and tungsten ore concentrates. Feedback from these projects has been used to inform the development of a regional certification system under the International Conference on the Great Lakes Region (ICGLR). Certification forms an integral part of their Regional Initiative against the Illegal Exploitation of Natural Resources (RINR) which aims to foster

113 De Koning, Ruben. 2011. Conflict Minerals in the Democratic Republic of the Congo: Aligning Trade and Security Interventions. SIPRI. <http://books.sipri.org/files/PP/SIPRI27.pdf>.

good governance in the mining sector across the DRC and its neighboring countries.¹¹⁴

Other group initiatives focus on improving the capacity and effectiveness of state institutions especially those dealing with the mining sector. PROMINES, supported by the World Bank, is one of such initiatives as it tries to help Congolese mining authorities.

Some other initiatives will be discussed in more detail in the next sub-section.

5.2 Main challenges facing coltan initiatives

Most policy initiatives aim to break the link between minerals and conflict primarily by denying armed groups the opportunity to sell minerals from the mines they control. This is the result of the well documented fact that trade in minerals has played a substantial role in financing numerous armed groups in eastern DRC. Constraining the opportunities for armed groups to raise revenues from minerals therefore seems to be a logical and moral objective. However, the normative value of this objective does not mean that decision-makers should not carefully analyze the likely intended or unintended consequences of their actions, their costs and their effectiveness in reaching the stated goals. In this sub-section we look at some of these issues.

We look at the policy initiatives from two perspectives:

- 1) The first perspective deals with the question: How important are conflict minerals to the continuation of violence in eastern Congo? Or, in other words, if the initiatives are implemented perfectly, will they stop the violence or, at least, significantly reduce it? This is the question of *effectiveness*.
- 2) The second perspective looks at the practical challenges surrounding the implementation of the initiatives. It addresses the following question: How likely is it that the proposed initiatives will be implemented as intended? And, what are their costs? Who is going to bear these costs? This is essentially about *efficiency* (understood in a broad sense) of the proposed initiatives.

114 German Federal Institute for Geosciences and Natural Resources (BGR), 'Mineral Certification at the BGR,' BGR, accessed November 12, 2012, http://www.bgr.bund.de/EN/Themen/Min_rohstoffe/CTC/Home/CTC_node_en.html.

Effectiveness

The thesis that minerals have been vital for financing at least some of the armed groups operating in eastern DRC is not contentious. Consequently, many observers argue that interventions that will stop (or substantially decrease) the flow of revenues to armed groups from the mineral trade should also undermine either their motivation to engage in violence or their means to do so (or both). As a result, the level of violence is expected to decline. This, however, is much more disputable and suggests that the driving factors behind the conflict are more complex than can be captured by a sole causal motive.

Issues relating to effectiveness largely boil down to the ‘Greed vs. Grievance’ question that was discussed in the previous chapter. Briefly recapping that discussion we can say that most experts do not see minerals (i.e. ‘greed’) as the root cause of the conflict in eastern DRC.¹¹⁵ Even many active advocates of conflict minerals initiatives in the NGO community tend to agree that minerals are just one of several drivers of the conflict.¹¹⁶

Armed groups need financial resources to sustain themselves, and this remains true whether profit is their primary motive or not. The most observable methods that armed groups use to profit from minerals are controlling the sites where minerals are mined and levying taxes and fees on mineral production and miners.¹¹⁷ If armed groups can no longer bring coltan and other minerals from those mines to the international market (as proposed in many initiatives) it would automatically have a negative effect on the financial resources available to armed groups. In practice, however, armed groups seem more likely to change the tactics they use to profit from minerals rather than to cease violence.

115 For example, De Koning, Ruben. 2011. *Conflict Minerals in the Democratic Republic of the Congo: Aligning Trade and Security Interventions*. SIPRI, and Nest, Michael. 2011. *Coltan*. Cambridge, UK: Polity Press.

116 *A Comprehensive Approach to Congo’s Conflict Minerals*. 2009. Washington D.C.: The Enough Project. <http://www.enoughproject.org/files/Comprehensive-Approach.pdf>.

117 IPIS estimates that armed groups directly controlled slightly above 50% of all mines they identified and mapped. See: Spittaels, Steven, and Filip Hilger. 2009. *Accompanying Note on the Interactive Map of Militarised Mining Areas in the Kivus*. Antwerp, Belgium: IPIS. <https://docs.google.com/viewer?url=http://ipisresearch.eu/download.php?id%3D267>.

If armed groups continue to control trade routes they can shift the burden of taxation to the mineral trade rather than production. They can also tax supplies to miners. This has been happening already in several areas of eastern DRC. For example, a report by the IPIS mentions that the FDLR supplied the Misisi gold mines in the Fizi district of South Kivu with goods and foodstuffs, trading them for gold, which they sell in Tanzania.¹¹⁸ An off-site taxation by ex-CNDP soldiers that controlled some of the major roads to Goma and taxed all passing transports is another example of situations where rebels do not have to control mines directly to benefit from mineral trade.¹¹⁹ Organized looting could also become more attractive for armed groups. After the FARDC (the Congolese armed forces) conducted several military operations against the FDLR and certain Mai-Mai militia and managed to take control over some mining areas from these groups in 2009-2010, there was a reported increase in looting attacks on mines and villages that these groups previously controlled.¹²⁰ In these looting attacks the resident population is often brutalized and inventories of minerals and other goods are taken. FARDC elements sometimes are also involved in looting, hiding their identity by pretending to be rebels.¹²¹

Even if the conflict mineral initiatives are successful in reforming the mineral trade in eastern DRC it is likely that armed groups will simply try to switch from minerals to other sources of funding. Examples from countries (often from Africa) affected by internal conflict suggest that there are numerous potential opportunities to raise revenues besides minerals, ranging from timber and agricultural products to kidnapping and piracy.¹²² In Sudan's civil war it was food aid that sometimes sustained fighting.¹²³ Remittances from diaspora and other types of transfers from abroad might also become a more important source of

118 Ibid, p.11

119 Ibid, p.11

120 De Koning, Ruben. 2009. Artisanal Mining and Post-conflict Reconstruction in the Democratic Republic of the Congo. SIPRI Background Paper. SIPRI. <http://books.sipri.org/files/misc/SIPRIBP0910b.pdf>, p.24

121 Ibid, p.23

122 Forum: War, Money and Survival . 2000. Geneva: ICRC, pp.22-27. Interestingly, this report notes that guerrilla movements resorted to self-financing including through mineral resources after their external support from the opposing Cold War blocks dried up following the dissolution of the Soviet Union.

123 'Scraps in Sudan.' 2000. The Economist, March 2. <http://www.economist.com/node/288025>.

revenue.¹²⁴ Arguably, under current conditions in eastern DRC minerals are the most profitable way for armed groups to raise funds, but other money-making opportunities may become more attractive if conditions change.

The impact of a shift in the financing sources of armed groups on the level of violence is uncertain but the possibility that violence increases instead of decreases cannot be excluded. It should be noted that the continuation of conflict does not require substantial funds, especially if immediate profits are not the main motivation for armed groups. The most widely employed weapons in the Rwandan Genocide in 1994 were very cheap machetes.

Efficiency

The discussion over effectiveness assumed that policy initiatives would be implemented successfully, work as intended and reach their objectives. However, in the real world implementation issues often undermine the effectiveness of policy initiatives. It is therefore useful to look at the most notable challenges to their successful implementation.

The most profound challenge for any policy initiative in the DRC is the fact that government effectiveness in the DRC is very low while the level of corruption is very high. According to the World Bank's governance indicators, the DRC's scores on both of these indicators were among the worst in the world: the DRC was in the bottom 3% of all countries in 2011.¹²⁵ Neighboring countries – with the exception of Rwanda – are not doing much better. Under these conditions the ability of the Congolese state to implement any significant reform is severely limited. This is extremely problematic since the involvement of Congolese public institutions and agencies is essential for implementing a scheme for conflict-free minerals. Weak institutions and corruption undermine the integrity of any such scheme. Without international effort and assistance to improve government effectiveness and to fight corruption, it is unlikely that interventions aimed at banning conflict minerals will work well. To assess how likely it is that proposed initiatives will be implemented as intended in a context of weak governance and corruption, it is instructive to look at two examples, the mining ban and the Kimberly Process.

124 Rwanda has played a significant part in supporting some of the rebel groups in eastern Congo.

125 World Bank, Worldwide Governance Indicators, <http://info.worldbank.org/governance/wgi/pdf/c248.pdf>

The mining ban

The mining ban was announced by president Kabila in September 2010. It suspended all artisanal mining activities and exports of minerals in the provinces of North Kivu, South Kivu and Maniema. Industrial mining companies were exempt from the ban. The main stated aims of the ban were cutting the financing of non-state armed groups and reestablishing state control. Although the artisanal mining activities did not stop completely after the ban was introduced, the volumes of minerals production dropped precipitously. Reliable estimates are hard to come by, but some observers suggested that, for example, gold production fell by about 80%.¹²⁶

One visible outcome of the ban was closer involvement and control over mineral production and trade by the FARDC and its individual officers. FARDC managed to take control of some mines that were previously under the control of other armed groups. This, however, did not lead to the cessation of mining activity. FARDC and police officers were sometimes paid to turn a blind eye to continued activity in the mines under their control. Mines in remote areas that were under control of other armed groups, such as the FDLR, also often continued production. The output of the illegal mines was smuggled to neighboring countries.

At the same time, the mining ban had a negative economic impact on artisanal miners. It also affected many people and businesses who supplied miners with goods and services, including farmers, traders, transport companies, etc. Around mining sites instances of malnutrition, diseases, school drop-outs increased as well as the number of thefts, robberies, armed attacks and murders.¹²⁷ Given the importance of artisanal mining in eastern DRC, these outcomes could have been easily anticipated.

The mining ban was lifted on March 10, 2011, six months after it was introduced. It had brought little if any improvements in security. The results of the ban can

126 Description of the impact of the mining ban is largely based on: Geenen, Sara. 2012. 'A Dangerous Bet: The Challenges of Formalizing Artisanal Mining in the Democratic Republic of Congo.' *Resources Policy* 37 (3) (September): 322–330. doi:10.1111/j.1540-5907.2009.00426.x.

127 Geenen, Sara. 2012. 'A Dangerous Bet: The Challenges of Formalizing Artisanal Mining in the Democratic Republic of Congo.' *Resources Policy* 37 (3) (September): 322–330. doi:10.1111/j.1540-5907.2009.00426.x.

be summarized as follows: miners, their families and people dependent on the mining activity were negatively affected, while many army and police officers became illegally involved in continued mining and benefited financially from the ban. The Enough Project concluded that the ban ‘has created more problems than it has solved.’¹²⁸

The experience with the mining ban has at least two important implications for other initiatives related to conflict minerals. First, the mining ban was relatively easy to implement as it was a blunt instrument affecting all mining sites (not just rebel-held) and all exports. As a consequence, the mining ban was far more easy to administer than any other more selective conflict mineral initiative where administrative discretion is going to be higher and less visible, hence creating more opportunities for corruption. Despite this fact, the enforcement of the ban was patchy and the level of corruption among officers and state officials involved in mineral trade increased, according to many sources. Second, following the logic that minerals are at heart of the conflicts in eastern Congo, the mining ban should have drastically reduced violence by stopping the flow of funding to armed groups. In reality, this did not happen.

The Kimberly process

Another example that illustrates some of the challenges related to the implementation of policy initiatives on conflict minerals and that offers some useful lessons for any certification scheme for minerals from the DRC is the Kimberly process (KP). The process was initiated and got its name at the meeting of diamond-producing African states in May 2000 in Kimberly, South Africa. Its main goal is ‘to stop the trade in ‘conflict diamonds’ and to ensure that diamond purchases were not financing violence by rebel movements and their allies seeking to undermine legitimate governments.’¹²⁹

The KP was a response to mounting pressure from NGOs (including Amnesty International, Global Witness and Partnership Canada Africa) to stop the trade in ‘blood diamonds’ which were used to finance rebel groups perpetrating mass killings and other human rights abuses. Two rebel groups in particular, UNITA

128 <http://www.enoughproject.org/blogs/congo-lift-mining-ban-eastern-region> (accessed February 8, 2013).

129 The Kimberly Process’ web site: <http://www.kimberleyprocess.com/web/kimberley-process/kp-basics> (accessed January 25, 2012)

in Angola and the Revolutionary United Front (RUF) in Sierra Leone, hugely benefited from the trade in blood diamonds.

The main element of the KP is the Kimberley Process Certification Scheme which was created in 2003. Only participants in the scheme can legally trade diamonds with each other. Rough diamonds crossing international borders should be transported in tamper-resistant containers and accompanied by a government validated KP certificate. Although participation in the scheme is voluntary, it became de facto mandatory for any diamond-producing country that wishes to export its rough diamonds to the international market, since all major importers of diamonds are members of the KP.

How successful was the KP in achieving its goal? Its official web site claims the following:

The joint efforts of governments, industry leaders and civil society representatives have enabled the Kimberley Process (KP) to curb successfully the flow of conflict diamonds in a very short period of time. Diamond experts estimate that conflict diamonds now represent a fraction of one percent of the international trade in diamonds, compared to estimates of up to 15% in the 1990s. That has been the KP's most remarkable contribution to a peaceful world...¹³⁰

Indeed, conflict diamonds currently represent only a small part of the total trade. This however, seems more a coincidence rather than a direct result of the KP. Two main conflicts where blood diamonds played a very substantial role ended before the KP Certification Scheme came into force. And in both cases it seems that military actions were more instrumental than economic sanctions directed at conflict diamonds:

- In Sierra Leone the decisive point was the British military intervention in 2000 and the capture of the RUF's leader, Foday Sankoh, by Sierra Leonean forces that left the RUF in disarray. In January 2002, Sierra Leonean President Kabbah declared the eleven-year long Civil War officially over.

130 <http://www.kimberleyprocess.com/web/kimberley-process/kp-basics>

- In Angola the civil war ended soon after government troops killed Jonas Savimbi, founder and leader of UNITA, on February 22, 2002. Less than a month later the government announced suspension of all military operations and UNITA rebels agreed to a cease-fire. UNITA officially demobilized its armed forces in August 2002 and became a political party.

Despite the self-acclaimed success of the KP, many of its participants express a general feeling of dissatisfaction with the scheme.¹³¹ Interviews with representatives of the diamond industry, NGOs and government officials indicate that the perceived lack of enforcement is considered the most prominent weakness.¹³² The issue of corruption was also mentioned as one the main problems in the KP. In 2004 it was exposed that diamonds from the DRC were being smuggled to the Republic of Congo (Congo-Brazzaville) where they were falsely certified by government officials as being produced in that country.¹³³ Fake certificates from DRC, Angola, Ghana and other countries continue to surface and plague the enforcement of the KP.¹³⁴

In December 2011 Global Witness, a London-based NGO and a founding member of the KP, left the process citing that ‘the KP has failed to deal with the trade in conflict diamonds from Côte d’Ivoire, breaches of the rules by Venezuela and diamonds fuelling corruption and state-sponsored violence in Zimbabwe.’¹³⁵

The current debates around the KP raise a very important question: what if human rights violations are conducted by the state authorities? This is not an abstract question for eastern DRC. The Congolese armed forces are closely involved in the mineral mining and trade, especially after the mining ban. This involvement has often been accompanied by illegal taxation of miners, corruption, and in some cases human right abuses. Banning the trade in minerals

131 Holger , Meyer. 2010. ‘Business, Boycott and Bureaucracy: The Kimberley Process Certification Scheme and the Global Quest for Conflict-Free Diamonds.’ <http://stockholm.sgir.eu/uploads/SGIR%20Holger%20Meyer%20Kimberley%20Process.pdf>.

132 Ibid, p. 69

133 Nest, Michael. 2011. *Coltan*. Cambridge, UK: Polity Press, p.134

134 <http://www.kimberleyprocess.com/web/kimberley-process/enforcement>

135 ‘Why We Are Leaving the Kimberley Process - A Message from Global Witness Founding Director Chairman Gooch.’ 2011. Global Witness. <http://www.globalwitness.org/library/why-we-are-leaving-kimberley-process-message-global-witness-founding-director-charmian-gooch>.

from such mines may make the Congolese government reluctant to cooperate with any such an initiative.

Establishing a certification scheme similar to the KP for conflict minerals mined in eastern DRC will face additional difficulties. First, it will have to include at least four minerals currently listed as conflict minerals, being tin, tantalum and tungsten (also known as the 3Ts) and gold. This would generate significant compliance costs, which is problematic since participation in schemes such as the KP places a substantial burden on poorer countries.¹³⁶ Second, conflict minerals are less susceptible to consumer boycotts than diamonds. Diamonds are luxury items that are highly visible and have high emotional value. This makes the diamond industry very sensitive to consumer boycotts. Conflict minerals (with the exception of gold) are used in industrial applications. Their value in a final product is often insignificant. Third, the value chain of conflict minerals is more complex and involves many intermediaries on the way to a final user, making verification and enforcement more difficult as well. In addition, the diamond mining industry is heavily concentrated with one large company dominating the market – De Beers, while the coltan industry is much less concentrated. This significantly increases the coordination costs for adopting a similar initiative for conflict minerals.

Dodd–Frank Wall Street Reform and Consumer Protection Act

Another set of challenges is related to the costs associated with the implementation of policy initiatives. In this respect it is interesting to look at what is one of the most important and probably consequential policy initiatives in this field: the Dodd–Frank Wall Street Reform and Consumer Protection Act, which was signed into law by US president Barack Obama in July 2010. Section 1502 of this Act (we will refer to it as Dodd-Frank 1502) requires companies that offer their securities (as in tradable assets) for sale to the general public in the US to report on the use of minerals from the DRC or neighboring countries (called ‘covered countries’ in the Security Exchange Commission (SEC) rule) in their products. After a long delay, the SEC in a narrow 3-2 vote approved a detailed rule for the implementation of the Section 1502 on August 22, 2012.¹³⁷ If a company

136 Elving, Alexander. 2012. The Kimberley Process. POLINARES Working Paper n.64. http://www.polinares.eu/docs/d4-1/polinares_wp4_chapter14.pdf.

137 Security and Exchange Commission, SEC Adopts Rule for Disclosing Use of Conflict Minerals, <http://www.sec.gov/news/press/2012/2012-163.htm>

uses minerals from the DRC or adjoining countries, it has to submit a report to the SEC describing the due diligence it exercises to prevent sourcing conflict minerals. The report has to be audited by an independent external party.

Seemingly, Dodd-Frank 1502 is just a disclosure requirement and does not directly ban companies from using conflict minerals; it is essentially 'name and shame law'. Therefore one could think that its impact is going to be limited. However, this is not likely. Few companies will want to risk being the target of an NGO campaign for using conflict minerals. The SEC estimates that Dodd-Frank 1502 will directly affect approximately 6,000 companies, including the largest US consumer electronics, IT and retail companies. Companies that are not listed on the US exchanges but form part of the supply chain of the US listed companies will have to bear many of the compliance costs as well.¹³⁸

The compliance costs of Dodd-Frank 1502 are going to be significant. The SEC estimated that the initial cost will be approximately \$3 billion to \$4 billion, and the annual cost of ongoing compliance between \$207 million and \$609 million. One natural benchmark to compare these costs is the revenue from conflict minerals in eastern DRC. The total exports of the 3Ts from eastern DRC in 2008 (peak year) were approximately US\$170 million, which is below the SEC's lowest estimate of the annual compliance cost. Adding gold exports, which are mainly informal and not well captured in official data, will increase the total revenue from exports. However, it does not change the conclusion that all exports of 3Ts and gold from eastern DRC (this includes exports from areas that are under government control and relatively peaceful) are less than the average estimate of the annual compliance costs. It should be also kept in mind that armed groups' profits from mineral trade are significantly smaller than the export revenues from eastern DRC. Thus, even ignoring the much larger initial cost of compliance, Dodd-Frank 1502 does not offer a very compelling proposition in terms of cost-effectiveness.

138 Securities and Exchange Commission. 2012. 'Final Rule: Conflict Minerals'. Securities and Exchange Commission. <http://www.sec.gov/rules/final/2012/34-67716.pdf>, p.299

	2007	2008	2009	2010
Cassiterite	\$44,228	\$159,765	\$111,144	\$95,525
Coltan	\$4,234	\$7,431	\$7,441	\$3,734
Wolframite	\$4,462	\$5,018	\$2,870	\$328
Export Total	\$52,924	\$172,214	\$121,454	\$99,586

TABLE 5 EXPORTS OF CONFLICT MINERALS FROM NORTH AND SOUTH KIVUS, IN US\$ '000S

This raises the question: who is going to bear the cost of compliance? Most likely the costs will be split between different stakeholders – consumers (through higher prices for final products), companies (through additional cost of compliance and, as a result, lower profits), etc. More importantly, a substantial part of the costs will be incurred by Congolese miners as well as miners from neighboring countries. This will happen primarily in the form of lower prices paid by buyers of minerals from these countries (since buying from the DRC and its neighbors will mean that a company has to produce and submit to the SEC a Conflict Minerals Report). Imposing costs on the people who are the least able to bear them is one unfair potential outcome of Dodd-Frank 1502.

The issues of costs and fairness would be more easily acceptable if Dodd-Frank 1502 would substantially reduce violence in eastern DRC. This, however, is far from certain and leaves the opposite effect, an increase in violence, as just as plausible. It is interesting to note that the SEC does not tackle this central question: how likely is it that the legislation is going to solve the root problem? It is unclear how Dodd-Frank 1502, even if it were successful in fulfilling its immediate goal – excluding conflict minerals from legal trade (and it is far from obvious that it would), will end the conflict in the DRC. Two SEC commissioners who voted against the rule raised the same issue. One of them, Troy Paredes, stated ‘there is a failure to assess whether and, if so, the extent to which the final rule will in fact advance its humanitarian goal as opposed to unintentionally making matters worse.’¹³⁹

139 ‘Statement at Open Meeting to Adopt a Final Rule Regarding Conflict Minerals Pursuant to Section 1502 of the Dodd-Frank Act by Commissioner Troy A. Paredes.’ U.S. Security and Exchange Commission. <http://www.sec.gov/news/speech/2012/spch082212tap-minerals.htm>.

The most likely outcome of the SEC rule will be a *defacto* ban on coltan and other conflict minerals from the DRC by companies listed on US exchanges. Companies that are not subjected to Dodd-Frank 1502 will still be able to buy coltan and other minerals from eastern DRC and their negotiating power will have increased. As a consequence, the price for coltan from Central Africa will be lower, other things being equal. The price differential between coltan from the DRC (and neighboring countries) and tantalum-bearing ores sourced elsewhere will be one manifestation of the Dodd-Frank 1502 compliance costs. The lower price will decrease the flow of mineral revenues to armed groups, but Dodd-Frank 1502 is unlikely to fully stop it.

No 'quick fix' solution

The above discussion suggests that focusing on limiting the revenues of armed groups from minerals in general and coltan specifically may be neither an effective nor efficient approach. Proponents of the initiatives have not put forward a convincing case of why and how their initiatives will lead to a significant reduction in violence in eastern DRC. In addition, there are many barriers to their implementation, such as weakness of governance, corruption and large implementation costs.

It seems that many initiatives are looking for an easy (although definitely not cheap) way around the difficult problems present in eastern DRC rather than trying to address their root causes directly. It should not be assumed that security in eastern DRC can be established just by banning conflict minerals. Banning conflict minerals should be, in the best case, a useful instrument to put additional pressure on armed groups rather than the primary objective of policy interventions. Armed groups can still operate at will in eastern DRC not because they have access to profits from the mineral trade but because government forces are unable to provide law and order. Congolese armed forces remain weak (as was vividly illustrated by the M23 rebellion at the end of 2012) and corrupt (the cases of their active involvement in illicit profiting from the mineral trade are abundant and well documented).

Dealing with armed groups requires a mix of military and political approaches, which should take the centre stage in efforts to bring security to eastern DRC. One important element in this respect is to improve the capabilities of the Congolese armed forces (at least some of the units). Without more capable and law-abiding armed forces in the DRC, hopes for peace and security are likely to

remain wishful dreams. This is why helping the DRC government to train its armed forces may be necessary.

The main problems in eastern DRC are deep-seated. Unfortunately, there is no readily available quick-fix that could easily solve them. Building capable and legitimate institutions and promoting economic development will take time and resources but these are necessary conditions for long-term security.

6 Conclusion

The DRC has been called a 'geological scandal' because the country is endowed with enormous mineral riches. These mineral riches could have driven the country's economic development and contributed to rising living standards for its population. However, decades of mismanagement, corruption and conflict has made the DRC a country with some of the lowest human development indicators worldwide. The link between mining and conflict in the DRC makes the country probably the most extreme example of the 'resource curse'. This report aimed to contribute to a better understanding of the role of minerals in the conflict in the DRC. The report focuses on one mineral in particular, namely coltan, which has become the most widely known symbol of the link between deadly conflict in the DRC and the exploitation of mineral resources by armed groups. Coltan is mined to produce tantalum, a rare metal with unique properties that has become a key enabler of information and communication technologies.

This case study has been conducted as part of the POLINARES project, an EU-funded research project exploring global challenges in the competition for access to natural resources and proposing new collaborative solutions. This report looks at the general aim of the POLINARES project from different angles. The first angle is to look at competition over resources in the DRC as potential cause of armed conflict, the most extreme case of competition. The second perspective illustrates that access to minerals is not an absolute goal and can be constrained by self-imposed actions if it conflicts with other objectives. Finally, the report analyzed several policy approaches and solutions that have been proposed by the international community in order to ease the problems surrounding coltan mining in eastern DRC. The analyses included an assessment of their (potential) impact, both in terms of efficiency and effectiveness.

Regarding competition and conflict, this report concludes that mineral resources have not been the main cause of the Congo conflict. However, they became

essential at later stages of conflict as a source of finance for armed groups. Armed groups have profited from Congo's mineral wealth by establishing various 'taxes' and fees, through extortion and theft, as well as via direct control of mines or trade middlemen. However, the importance of coltan as a source of revenue for armed groups is often exaggerated. With an exception of a very short-lived coltan boom in 2000-2001, it was never the substantial source of funding for the conflict. In short, coltan was never the main instigator of the conflict in the DRC and was at most a contributing factor.

Regarding access to natural resources, the report reviewed several policy initiatives that aim to curb the conflict in the DRC by focusing on revenues from minerals in general and coltan specifically. These initiatives show that the economic need to secure access to minerals can conflict with other more normative values, such as acting against human rights violations. Western democracies can and have shown some signs of adopting policies to curb such access based on normative concerns. These policies, however, are not cheap – they often involve substantial costs (through higher mineral prices and/or firm compliance costs). We evaluated these policy initiatives on their effectiveness and efficiency, and we identify problems for both dimensions.

First of all, our analysis finds obstacles to the effectiveness of the policy initiatives. Armed groups are opportunistic in terms of sources of funding. Minerals have so far been the easiest and most available source of revenue. Rebels rely on the territory they control to extract the means to sustain themselves. If trade in minerals is banned and will no longer provide enough income to finance their activities, rebels will shift to other (probably less profitable) sources of revenue, e.g. by taxing agriculture or foreign aid. As a consequence, there is little convincing evidence that initiatives focusing on limiting mineral revenue will lead to a significant reduction of violence in the DRC. Second, even under the assumption that the proposed initiatives would be effective, i.e. if they would cease the conflict by reducing the mineral revenues of armed groups if implemented perfectly, there are issues related to the efficiency of the proposed initiatives. Our analysis shows several challenges that undermine the implementation of the initiatives, including weak governance, corruption and compliance costs.

We conclude that the limited results offered by existing policy initiatives are due to the fact that they are merely addressing symptoms of a deeper problem.

As long as the underlying reasons for conflict continue to exist and the right governance structures to address grievances are lacking, the envisaged effects of the policy measures remain limited.

The main problem in the Congo is the Congolese state itself, especially its armed forces. The DRC government lacks control over large parts of its territory; it cannot ensure security and protection of its population. Furthermore, the Congolese army has conducted war crimes and been involved in illegal exploitation of mineral resource including coltan. Unless the DRC state institutions can fulfill their basic functions, including security provision, attempts to solve conflict through measures aimed at minerals only are unlikely to succeed. The weakness of governance in the DRC is the main barrier to the efficient implementation of policy initiatives.

Ending the violence of armed groups requires a long-lasting and comprehensive approach, which combines military, political and economic efforts. As long as policy responses focus merely on reducing mineral trade, armed groups will continue to move to other sources of revenue to finance their activities. A priority should be to ensure that the Congolese state regains its monopoly on means of violence. Targeting individual steps of the tantalum supply chain will not guarantee that armed groups will not shift the burden of illegal fees to different steps. The comprehensive answer to the problems in the DRC consists of building capable and legitimate institutions, restoring the state's monopoly on violence and promoting economic development that is not based on illegal activities.

Appendix A: Tantalum mining

Overview of operating or suspended industrial mines¹⁴⁰

- By known reserves, the *Wodgina and Greenbushes mines in Australia*, both owned by Global Advanced Metals, are the largest reserve of tantalum. However production at the mines has been sporadic over the past few years, with Wodgina closing in December 2008, resuming operations for a 7 month period in 2011 and being shuttered again by 2012. The Greenbushes mining operations were halted in December 2008 and, while the mine has remained shuttered, its processing facilities have been appropriated to refine ore from Wodgina and from other mines in Australia. Wodgina's mine capacity is estimated at 635 tonnes of tantalum pentoxide, while Greenbushes' estimated capacity is 453 tonnes. Global Advanced Metals has indicated that the mines will be reopened when conditions are 'appropriate'.
- The current largest operating tantalum mine is the *Mibra*, run by Companhia Industrial Fluminense, a part of the *Advanced Metallurgical Group (AMG) in Brazil*. Its operations suffered significant disruptions in 2011 due to heavy rains in Brazil. In 2011 the company announced plans to expand its tantalum capacity to 181 tonnes per year, with \$7.2 million expenditure to expand its processing facilities. The mine accounts for nearly 20% of the current global primary production of tantalum, an increase its share of 5 to 10 % in 2007-2008.
- The *Marropino mine*, owned by Noventa, is the only industrial-scale tantalum mine in operation in *Mozambique*. The mine was shut down in 2009 to complete an electrification program and was restarted in April 2010. A new processing plant is near completion at Marropino, with an expected capacity of 272 tonnes of tantalum. A full production schedule is expected to be achieved by the end of 2012.

140 Raw Materials Group, 2012.

- The *Kenticha mine in Ethiopia* is operated by Ethiopia Mineral Development Enterprise. The company is currently working to expand mining at Kenticha from 200 tonnes per year of tantalite to 350 tonnes per year, and it is planned that a beneficiation plant will be built in Ethiopia to upgrade the ore to 30 percent concentrate and to remove radioactive elements. In a bid to ensure that reserves are available for the envisioned processing facilities, the government announced a ban on exports and mining of tantalum in mid-2012, until production facilities were complete. The state-owned company expects to export 1,000 tonnes of tantalum concentrate over 15 years (the expected national reserves).
- Of the other known mines, there is the *Yichun mine in China* operating under the jurisdiction of Jiangxi group and claiming to account for 44% of the verified reserves of tantalum and niobium in China. The *Lovozero mine in Russia* is operated by LGOK, (part of the Solikamsk Magnesium Works group) and produces 54 tonnes per year of tantalum pentoxide. The *Tanco mine on Lake Bernic in Manitoba, Canada*, with a capacity of 68 tonnes per year, has been shut down since 2009 and has not resumed operations.
- As a by-product of tin smelting, tantalum is produced in *Malaysia* and *Thailand*. In Southeast Asia, the tin industry still provides tantalum as a by-product of the smelting of cassiterite ore concentrates for tin production. Struverite concentrates (a Ti-Nb-Ta mineral) have historically also been available from northern Malaysia containing 9-12% tantalum oxide.
- The *Pitinga (Parapanema) mine in Brazil*, operated by Mineração Taboca, (part of Minsur SA) has the potential to produce 91 tonnes per year of tantalum peroxide, as a by-product of tin mining and smelting, but mining has been on hold during equipment refurbishment and instead production has come from old tailings. Table 2 below lists the major mining operations for tantalum ore by state of operations.

Operational status of some major tantalum mines in 2012

Mines in the DRC are not included because most of the mining there is artisanal and small-scale in nature.

NAME	COUNTRY	STATUS
Mutala Tantalum Deposit	Mozambique	Project, no spec
Brockman Tantalum Deposit	Australia	Conceptual
Cattlin Creek Tantalite Deposit	Australia	Conceptual
Upper Fir Tantalum/Niobium Deposit	Canada	Conceptual
Abu Dabbab Tantalum-Tin Deposit	Egypt	Feasibility
Morrua Tantalum Deposit	Mozambique	Feasibility
Arthur River/Beryl Hill Tantalite Mine	Australia	Operating
Kenticha Tantalum Mine	Ethiopia	Operating
Mibra (Nazareno) Tantalum Mine	Brazil	Operating
Bald Hill Tantalite Mine	Australia	Operating
Marropino Tantalum Mine	Mozambique	Operating
Greenbushes Tantalum Mine	Australia	Suspended
Dalgaranga Tantalum Mine	Australia	Suspended
Wodgina Pan West	Australia	Suspended
Etykinskoye Tantalum Mine	Russia	Closed
Mount Cassiterite Tantalum Mine	Australia	Closed
Mount Farmer Tantalum Mine	Australia	Closed
Pilgangoora Tantalum Mine	Australia	Closed

TABLE 6 MAJOR MINES FOR TANTALUM BY STATE OF OPERATIONS¹⁴¹

141 Raw Materials Group, 2012.

Tantalum mining projects in the pipeline¹⁴²

The following tantalum projects are in the pipeline, ranging between pre-feasibility and under construction:

- Commerce Resources Corp. has completed a preliminary economic assessment for its Upper Fir tantalum-niobium deposit, indicating that the project can be developed economically as an underground mine and recommending further studies to support a pre-feasibility level assessment of the project.
- Crevier Minerals Inc. is working on a feasibility study at its niobium-tantalum property in Quebec's Saguenay-Lac-Saint-Jean region, including a HF leaching program that has been underway since November 2011. The leaching aims to recover the niobium and tantalum oxides contained in a concentrate produced by pilot-plant flotation testing done in 2011.
- Eramet SA continues laboratory and pilot testing of a process tailored for the ore from the Mabounié deposit in Gabon, which constitutes a major potential source of various elements including tantalum. Once process development is complete, Eramet is planning to build a pilot plant in Gabon in 2014-2015.
- Globe Metals & Mining Ltd is developing the Kanyika niobium-tantalum deposit in Malawi and in 2011 entered into a strategic partnership with East China Mineral Exploration & Development Bureau (ECE). It is currently carrying out a definitive feasibility study, which is planned for completion in December 2012.
- Australia based Gippsland Ltd is developing a huge tantalum-tin resource in Egypt. The project includes a 44.5 million tonne Abu Dabbab deposit, scheduled for production by 2012, and the 98 million tonne Nuweibi project. The company plans to produce about 300 tonnes of tantalum peroxide a year from its Abu Dabbab project.
- An Australian company, Ram Resources ltd, has acquired 51 percent of the Motzfeldt poly-metallic deposit in southern Greenland. Motzfeldt has the potential to be a giant niobium-tantalum deposit with a possible by-product rare earth element. The overall resource could be in the region of 500 million tonnes although further work is required to define a JORC compliant estimate.

142 Raw Materials Group, 2012.

Appendix B: Actors involved in DRC conflict

A overview of the key people and parties involved in the conflicts in the DR Congo

ACTOR	ABBREVIATION	ORIGIN	BACKGROUND INFORMATION
Alliance of the Democratic Forces for the Liberation of Congo	AFDL	DRC	AFDL was a coalition of Congolese dissidents supporting president Kabila
Allied Democratic Forces	ADF	Foreign: Uganda	Ugandan Islamist rebel force whose presence has been reported in the Beni territory of North Kivu Province since 1995; the overall objective of ADF is to overthrow the Government of Uganda and to place a Muslim in power
Mouvement de Liberation du Congo	MLC	Foreign: Uganda	Ugandan-backed militia force fighting against the Congolese government; today it is the largest opposition party in the DRC
Rassemblement Congolais pour la Democratie	RCD	Foreign: Uganda, Rwanda	Rwandan and Ugandan backed rebel group aiming at overthrowing president Kabila
Forces de Résistance Patriotique d'Ituri	FRPI	DRC	Beni-based armed militia in the Ituri Province; fighting for the rights of the Ngiti ethnic group; counterweight to the UPC in the Ituri conflict
Union des Patriotes Congolais	UPC	DRC	Political and militia group in Ituri; fighting for the rights of the Hema ethnic group
March 23 Movement	M23	DRC	Rebel military group based in eastern areas of the DRC, it aims at establishing a parallel administration in the DRC
National Congress for the Defense of the People	CNDP	DRC	CNDP is a Congo-based rebel group that was one of the most destructive groups in eastern Congo; since 2009 it is officially integrated in the FADRC
Democratic Forces for the Liberation of Rwanda	FDLR	Foreign: Rwanda	The most politically significant and militarily powerful armed group in eastern Democratic Republic of the Congo; it consists mostly of Hutus fighting against Tutsi for more influence in the region
Mai-Mai rebellion		DRC	Several armed sub-groups operate under the name Mayi-Mayi; rebels resist to be integrated in the FADRC and aim to defend their territory against other armed groups
Lord's Resistance Army	LRA	Foreign: Uganda	Ugandan rebel group led by Joseph Kony; its political agenda is unclear; it attacks civilians in the border area of Uganda, the DRC, South Sudan and the Central African Republic
Congolese Army, led by President Kabila	FADRC	DRC	
Ugandan Army, led by President Museveni	UPDF	Foreign: Uganda	
Rwandan Army, led by President Kagame	RDF	Foreign: Rwanda	
UN peacekeeping mission	MONUC	UN	

TABLE 7 OVERVIEW OF ACTORS INVOLVED IN DRC CONFLICT¹⁴³

143 Insight on Conflict, "DR Congo: Key People and Parties," Insight on Conflict, accessed October 30, 2012, <http://www.insightonconflict.org/conflicts/dr-congo/conflict-profile/key-people-and-parties/>; Group of Experts on the Democratic Republic of the Congo, S/2011/738: Final Report 2011 of the Security Council Committee Established Pursuant to Resolution 1533 (2004) Concerning the Democratic Republic of the Congo (United Nations, 2011), http://www.un.org/ga/search/view_doc.asp?symbol=S/2011/738.



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