International Journal of Latest Research in Engineering and Technology (IJLRET)
ISSN: 2454-5031(Online)
www.ijlret.com‖ Volume 1 Issue 3‖August 2015 ‖ PP 80-105

Study of the Forestry and Artisanal Diamond production linked to the conflict in the Central African Republic (CAR)

BASSANGANAM Narcisse[1], Ph. D Yang Mei Zhen[2], Ph. D Prince E. YEDIDYA DANGUENE[3], Associate Prof. Minfang Wang[4]
Earth Resource, China University of Geosciences, Wuhan
Sciences Faculty, University of Bangui, CAR

ABSTRACT: The Central African Republic (CAR), a country with rich in timber and diamond deposits and a tumultuous political history. Central African Republic once had the third largest area of rainforest cover in Africa. Today, while tropical forest covers 36 percent of the country, most of this has been degraded by logging. Very little of Central African Republic forest cover can be considered primary forest.

Diamond mining and forestry form the bulk of the economy of the Central African Republic. Burdened with poor infrastructure and high transportation costs, a largely unskilled work force, and poor economic policies, the Central African Republic is not a particularly attractive source for timber among African producers. Nevertheless, most of the country's forests have been logged for valuable tree species including sapelli, ayous and sipo. Most wood from the Central African Republic is exported to Europe. Deforestation and poor agricultural practices are resulting in desertification in the northern parts of the country.

Diamonds as Timber are supposed to be symbols of love, commitment, and joyful new beginnings. But for many people in diamond-rich countries, these sparkling stones are more a curse than a blessing. Too often, the world's diamond mines produce not only diamonds – but also civil wars, violence, worker exploitation, environmental degradation, and unspeakable human suffering.

When discussing the link between conflict and insecurity on the one hand and natural resources on the other, terms like 'conflict diamonds' or 'blood diamonds' easily come to mind. Particularly, the alliance between the CAR regime and Congolese rebel leader Jean-Pierre Bemba at the turn of the century. Bemba's troops thwarted a coup attempt against Patassé in 2001 and he allegedly had links with two Central African diamond buying offices. Bemba financed his war in the DRC by controlling the sale of one to three million dollars worth of diamonds a month. Diamonds that were mined in the Congolese territory held by Bemba were allegedly often sold or laundered through the CAR. This linked; experienced in the conflict in the CAR is the goal for our study.

KEYWORDS: Forestry, Artisanal Diamond, Conflict, CAR.

I. INTRODACTION

The Central African Republic is a landlocked country in Central Africa. It is bordered by Chad to the north, Sudan to the northeast, South Sudan to the east, the Democratic Republic of the Congo and the Republic of the Congo to the south and Cameroon to the west. The CAR covers a land area of about 622,984 square kilometers (240,535 sq mi).

The CAR disposed two main areas production of the diamonds, at Eastern by Mouka-Ouadda Sandstone and the most important in the Western by Carnot Sandstone. The forests are located at south of the CAR in the regions bordering to the Democratic Republic of Congo (Fig. 1-1, 2-1). The CAR is known for its wealth in mineral resources, over the past decade till today the CAR confronts the different crises that linked to its natural resources; this is the focus of this study.

Diamonds have been linked to conflicts in several countries in recent decades, including those in Sierra Leone (Smillie et al., 2000), Angola (Le Billon, 2001), the Democratic Republic of the Congo (DRC) (Samset, 2002), Ivory Coast (UNSC, 2005), and Liberia (UNSC, 1992). Most recently, the international community has voiced concern that the diamonds in the Central African Republic (CAR) may be the latest example of a conflict resource. As calling blood diamond or diamond of conflict most of the diamonds occurred from Africa continent or a country rich in diamond producing and in conflict. According to the CAR those resources mineral did not escape in the conflict.

Gold and diamonds in Central Africa easily conjure up images of conflict, rebel funding, human rights violations, and smuggling. As a country landlocked within an unstable region, neighboring the Democratic Republic of Congo (DRC), and recently the scene of another coup attempt, the Central African Republic (CAR) might be considered an appropriate candidate for analysis within the conflict-mineral perspective. Yet this framework would ignore the country's mining sector's very specific characteristics. The sector offers an essential livelihood to many households, represents the country's second most important export product, and is

organized in a particular way. Nonetheless, a wide range of issues regarding the country's mining sector persist, (Ken Matthysen and Iain Clarkson 2013 .CAR Gold & Diamond Mining).

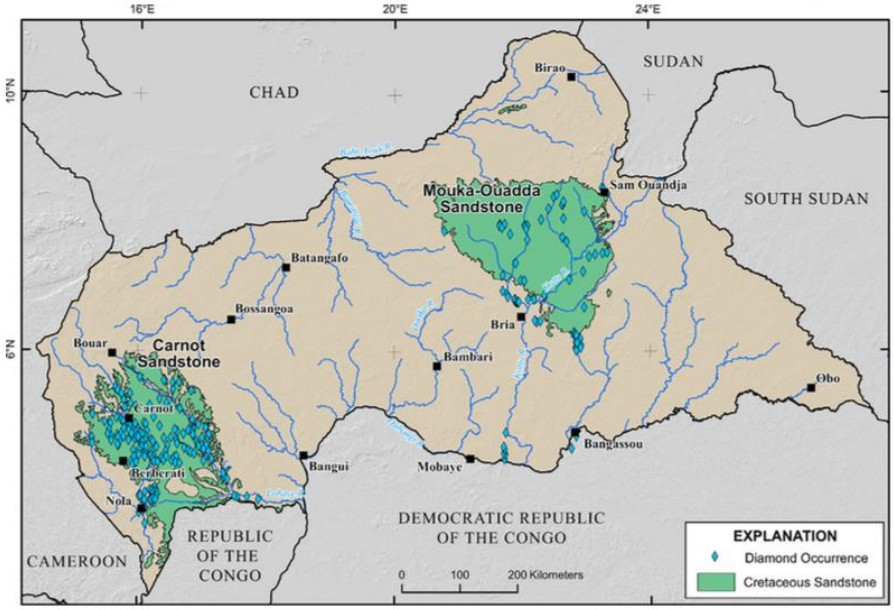


Fig. 1-1: CAR's map and diamond deposits area (Carnot and Mouka-Ouadda Sandstone formation).

II. LOCALISATION OF STUDY AREAS CONCERNING

2-1 Location of forests

Located In the south-west, in the regions of Sangha and Lobaye, forests cover an area of 3.7 million hectares. Most logging concessions are located in this area, especially along the borders with Cameroon and Congo. This area is also where most of the diamond mining takes place; in the east, in the Bangassou area, forests cover an estimated 1.2 million hectares. This region is very isolated, and little is known about its forests. They are not being exploited commercially because of transport difficulties. (Forests Monitor. Reports 2006)

Located entirely within the tropical zone of Central Africa, the Central African Republic has an area of 622,984 sq km (240,535 sq mi), extending 1,437 km (893 mi) E–W and 772 km (480 mi) N–S. Comparatively, the area occupied by Central African Republic is slightly smaller than the state of Texas. Compared to the other countries in the Congo region, CAR has a relatively small area of forest around five million hectares corresponding to 8% of the country's territory.

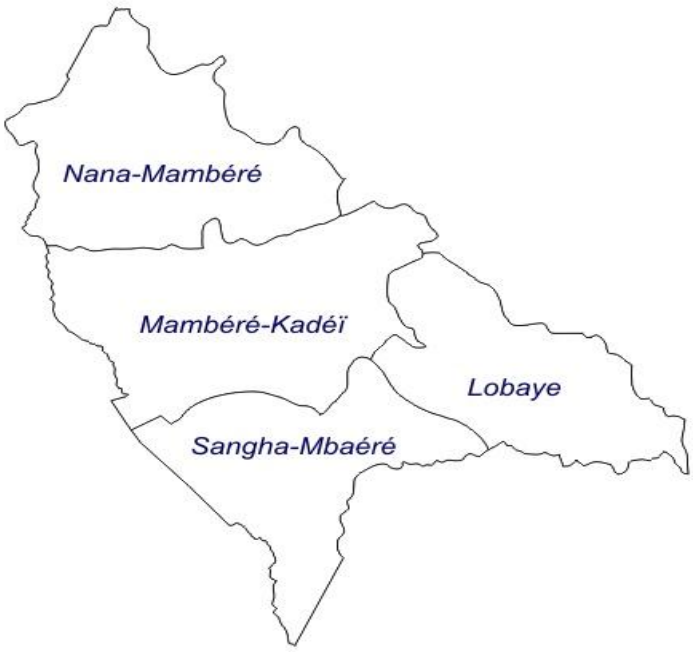


Fig 2-1: CAR's S-W areas cover by forest

2.2 Carnot sandstone

Previous study By Peter G and others (Report 2010). The Carnot Sandstone is of Mesozoic age and of fluviatile origin, which, in the most recent depositional environments, may have also included lacustrine and palustrine deposits. As a result, the formation is composed of several successional layers of conglomerates, sandstones and mudstones, and siltstones. It lies in the southwestern part of the CAR and covers an area of more than 40,000 km². The thickness of the unit is highly variable but has been reported to be as thick as 300 to 400 m in places (Censier, 1990). Heavy mineral and quartz exoscopic analysis (Censier, 1990) demonstrate that the detrital material of the Carnot came from a southerly origin, has similar mineralogical composition throughout the whole in filled basin, and was composed of reworked detrital formations. The Nola and Bolé River series was originally thought to be the source of the reworked material. Subsequent analysis supports the assigning of the glacial Devonian–Carboniferous Mambéré Formation and the Precambrian schist and quartzite rocks as the source of the detrital materials that have been reworked and cemented into the Carnot Sandstone. The underlying Precambrian granitic-gneissic complex of rocks formed the landscape for Carnot deposition (Censier and Lang, 1999). The paleogeography and paleotopography show that this landscape was a general peneplain with monadnocks. The monadnocks' subsequent erosion causes the mineralogical heterogeneities in the current landscape and also results in the irregularities in the basal surface of the Carnot Sandstone. The surface of the original sedimentary basin was much larger than has been interpreted on the basis of current limits of the Carnot Sandstone. The western margin may have extended beyond the CAR and Cameroon border (Censier, 1990).

Deposition of the reworked material occurred from the Albian to the Maastrichtian in north-northwest-flowing riverine braided channels flowing into the Doba Trough (Chad) and into the Touboro Basin (Cameroon) (Censier and Lang, 1999). Subsequent uplift and faulting during the Cenozoic reversed the direction of low and erosion of the Carnot from north-northwest to south-southeast and emplaced the current fluvial drainage system.

Followed previous study of (Claude Censier, Jacques Lang 1999). The discovery of the first diamond-bearing alluvial deposits in 1931 marked the onset of mining and geological surveying in the west and southwest CAR. Subsequently, reconnaissance studies of the Carnot Formation were carried out (Asselberghs, 1934) and various scale maps were made (Babet, 1948; Gerard and Gerard, 1953a, b; Wolff, 1962). The realisation that the Carnot Formation was the host rock of the diamonds led to its detailed geological study (Borgniez, 1935; Babet, 1935; Delany and Delorme, 1956; Berthoumieux and Delany, 1957). This work, which was mostly undertaken for mining companies, was interrupted when exploitation stopped after the country became independent (1960).

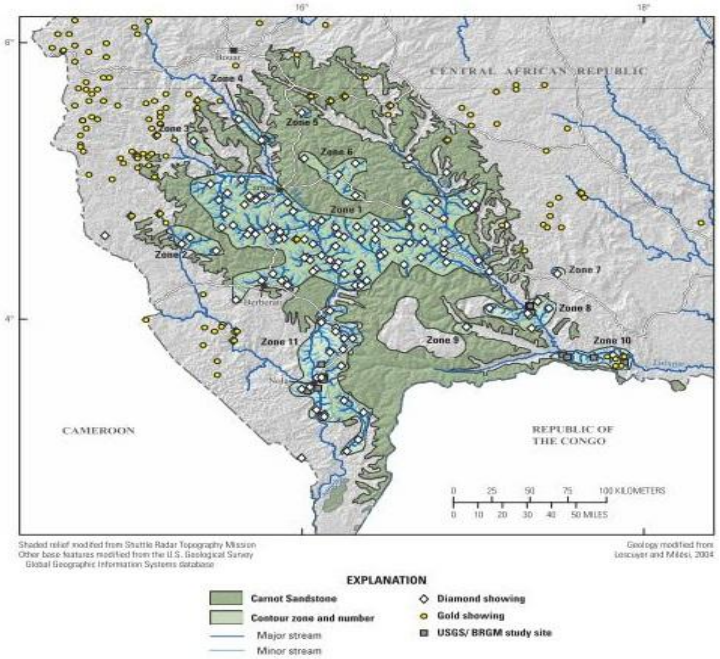


Fig. 2-2: Location diamond deposit and Carnot Sandstone formation

2.3 Mouka-Ouadda Sandstone

The Mouka-Ouadda Sandstone is Cretaceous fluviatile sandstone that lies in the eastern Central African Republic. It is thought to be the secondary host rock of the alluvial diamond deposits in the region. The Mouka-Ouadda Sandstone covers an area of approximately 40,000 km², forming a plateau that is generally less than 500 m thick. It is composed of layers of sandstone and conglomerate. Similar to that of the Carnot Sandstone, the Mouka-Ouadda is thought to have been derived from detrital material from the Fluvial-glacial Kombélé

Formation and from the Precambrian schist and quartzite complex and was also deposited on a peneplained Precambrian granitic- gneissic basement. Paleocurrent measurements indicate that the major source of sediment lies to the south-southwest, and the direction of deposition was to the north-northeast. As structural evolution of the landscape progressed, the orogenic uplift to the north reversed the riverine low, thus developing the current drainage system (Malingbar and others, 2006).

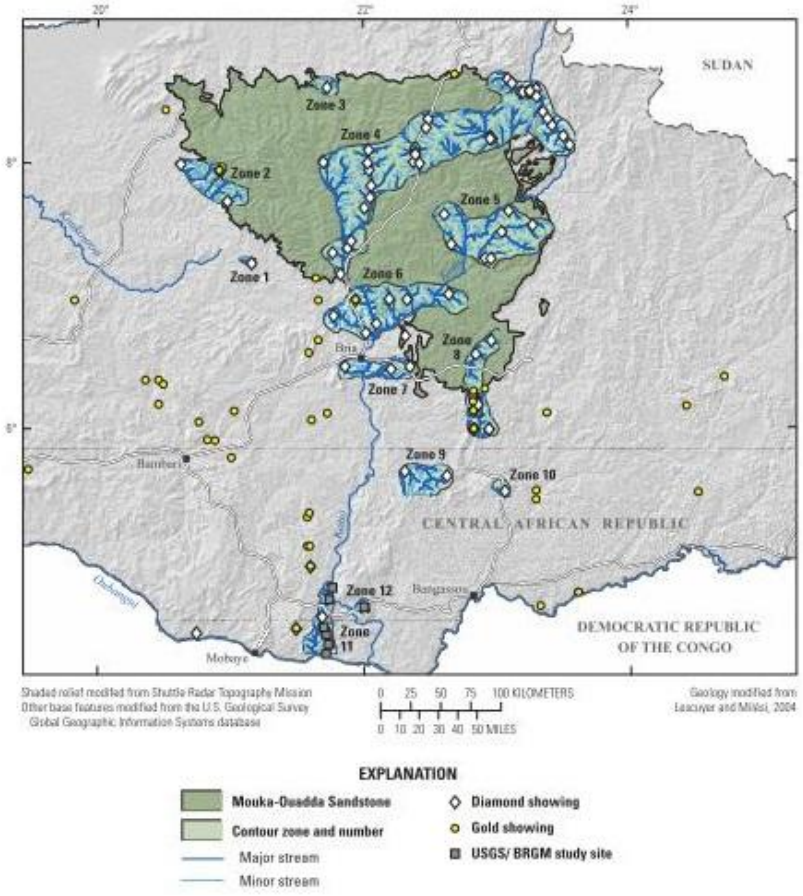
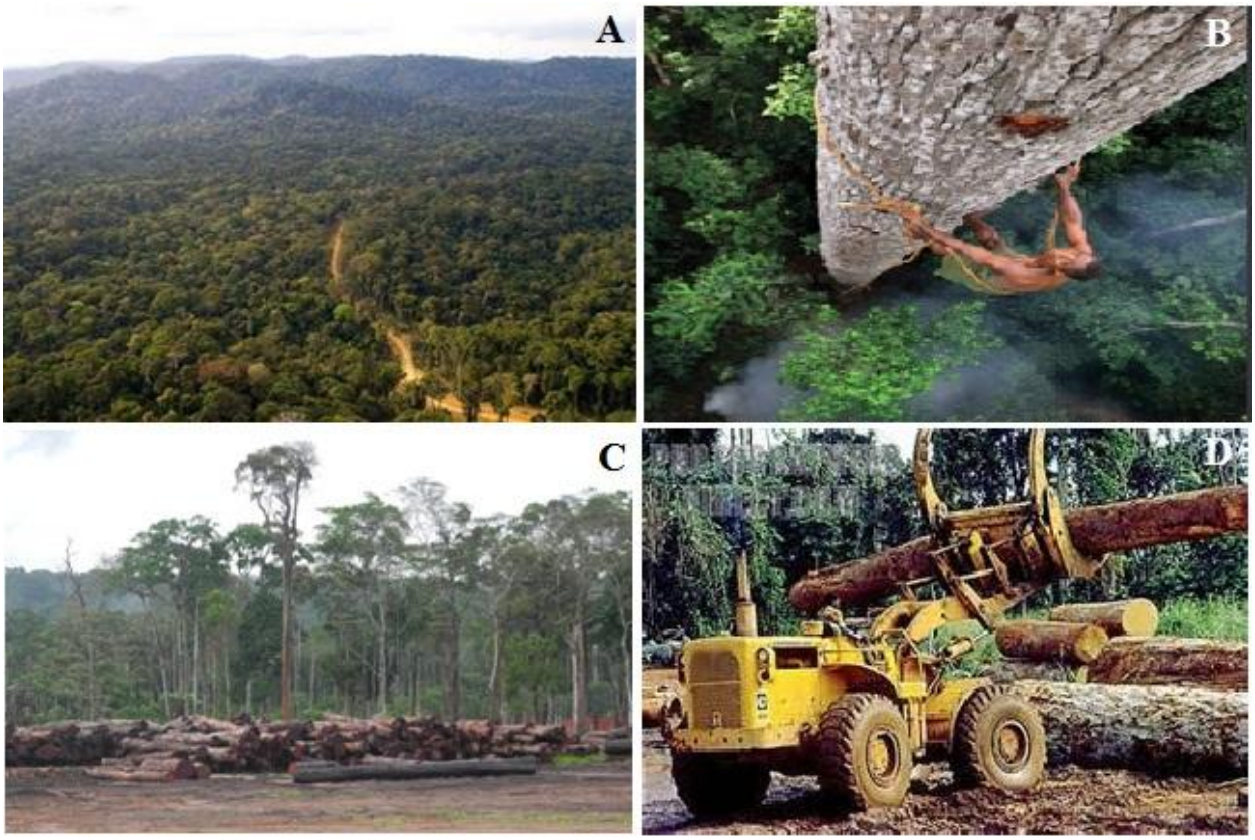


Fig. 2-3: Location diamond deposit and Mouka-Ouadda Sandstone formation

III. PHYSICAL GEOGRAPHIC

3.1 CAR forestry

An estimated 15 percent of CAR's territory is covered by forests, part of the Congo Basin rainforest, vital to the regional and global climate as the second largest tropical forest in the world after the Amazon. Located in the South-West and South-East of the country, these forests are a vital source of livelihood for an estimated 15,800 forest-dependent peoples including thousands of indigenous people. The forests are exploited by both artisanal and industrial loggers.



Appendix 3-1: CAR's Lobaye areas forests

3.1.1 Artisanal and industrial forestry and transportation

The artisanal sector is mostly informal, generating 33,000 cubic meters of sawnwood for the local market, but a further 6,000 cubic meters, most of it illegal, is exported to Chad. The sector answers to the needs of local populations, 90 percent of whom use wood for their energy needs. Before the 2013 crisis, it employed an estimated 2,000 people.

The industrial sector, on the other hand, commercially exports roundwood (logs) and sawnwood, mainly to China and the European Union. In 2013, six logging companies operated in CAR in 11 concessions: IFB, SEFCA, SCAD, SCAF, SCD and VICWOOD group (its subsidiaries Vica, Thanry Centrafrique and Sofokad hold logging titles). Active in the country's South-West, these companies are owned by foreign investors, and due to the country's very low levels of economic development, hold an outsized influence in the country. Before the war, they were responsible for slightly more than forty percent of export revenues, 10 percent of its GDP, and generated revenues of around EUR 3.5 million a year, which apparently accounted for 34 percent of government revenues. Before the crisis, the sector employed approximately 4,000 people, and apparently supported 6,000 indirect jobs, a figure now in constant decline (currently 2,717 direct jobs) according to the Minister of Forests. The war is believed to have reduced the sector's turnover by half.

There are 22.9 million hectares (56.5 million acres) of forest (37% of the total land area), but only 3.4 million hectares (8.4 million acres) of dense forest, all in the south in the regions bordering the Democratic Republic of Congo. The CAR's exploitable forests cover 27 million hectares (68 million acres), or 43% of the total land area. Transportation bottlenecks on rivers and lack of rail connections are serious hindrances to commercial exploitation. Most timber is shipped down the Ubangi and Zaire rivers and then on the Congo railway to the Atlantic. More than a dozen types of trees are felled, but 95% of the total is composed of obeche, sapele, ebony, and sipo.

A dozen sawmills produced 703,000 cu m (25 million cu ft) of sawn logs and veneer logs in 2000. The government is encouraging production of plywood and veneer. Roundwood removals were estimated at 3 million cu m (106 million cu ft) in 2000. Competition from lower-cost Asian and Latin American loggers has hurt the local industry, which is encumbered with high transportation and labor costs. In 2000, the country exported $39.6 million of roundwood and $16.3 million of sawn wood.

Appendix 3-2: CAR's timber transporting

3.1.2 Illegal practices and permits in the logging sector

The complete absence of government controls has obviously increased the likelihood of logging companies engaging in illegal and hence harmful practices in the country's rainforest. A number of illegalities have been recorded in recent years. In 2012, an audit conducted in the framework of a WWF project showed that SEFCA and IFB were not following laws regulating labour conditions, harvesting practices, environmental protection, etc. In the case of SEFCA, there were 16 cases of major non-conformity identified; it indicated major illegalities, including in its logging operations.

First on the list: the applications submitted by the companies were deficient in various ways. The documents submitted by some of the companies did not provide information on company ownership and the origins of their shareholders. Many essential documents were also absent, inter alia: tax payment certificates, bank guarantees, proof of at least five years of experience in the logging sector, corporate affiliations.

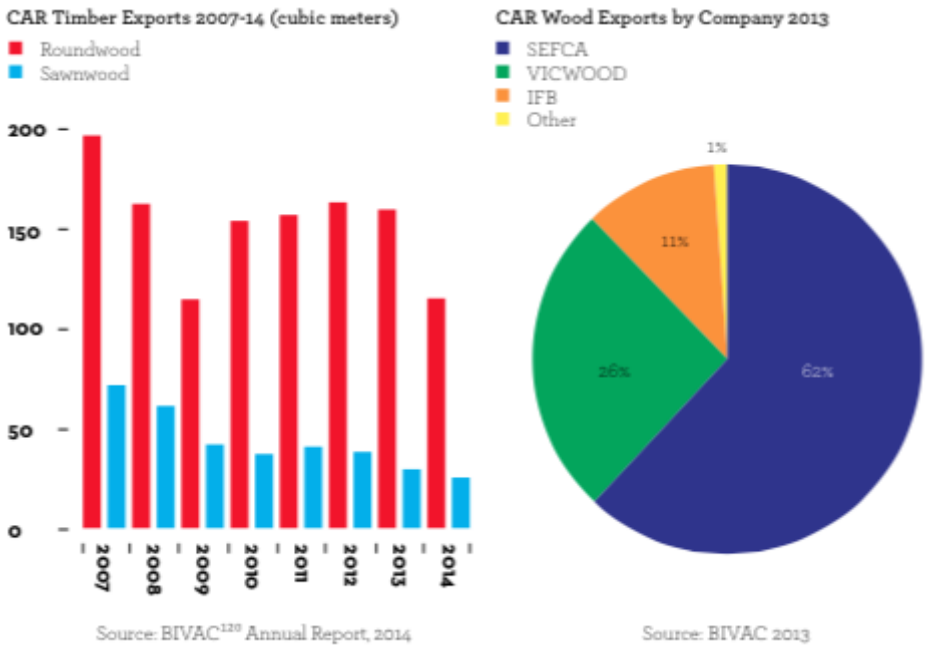


Fig 3-1: CAR Timber Exports 2007 (cubic meters) (Blood timber July 2015)

3.2 CAR's Diamond

CAR's diamond deposits are generally of high quality, with approximately 40% of stones being of gem quality (Bardet, 1974). The diamonds located within the Carnot and Mouka-Ouadda Sandstone formations represent CAR's two significant diamond deposit zones. One distinguishing factor between these two deposits is the fact that in the east, 85–90% of the stones are of high to medium quality (Bardet, 1974; WGDE, 2012). These stones are also often larger than those found in western CAR, with stones of 10 carats or greater frequently recovered. While the average price per carat in CAR is $169.79 (in 2012), the value of stones in eastern CAR ranges from $200 to more than $300 per carat (WGDE, 2012). Some discrepancy exists concerning the quantity of diamonds located within each zone. Production figures suggest that 65–75% of diamond production comes from western CAR, with eastern CAR contributing 25–35% (Bardet, 1974; Censier, 1996). However, Chirico et al. (2010) calculate that the two plateaus are similarly endowed with diamonds. This result suggests that the higher western zone production figures noted by Bardet (1974) and Censier (1996) may be a function of population density and mining intensity, as the west is significantly more populated and is known to have more artisanal miners and active mine sites than the east. The lower production figures for eastern CAR may also reflect the presence of unofficial channels through which diamonds mined in the east exit the country (Matthysen and Clarkson, 2013). Institutional capacity is particularly low in eastern CAR, Rendering it difficult for the country to guard against illicit smuggling and trading.

3.2.1Illegal practices on CAR diamond

Diamonds from eastern CAR have been smuggled through South Darfur and Chad, and armed bandits and rebels set up roadblocks and steal from miners and traders (ICG, 2010). According to the low Institutional capacity in eastern CAR, While it is clear that the diamonds producing in eastern have a link in recently conflict in the CAR, according to the illegal diamonds transaction through South Darfur and Chad, and the high percentage of people from Chad and Sudan joining the group armed in the eastern diamonds areas production of CAR and formed Seleka rebel that is estimated as 15% for CAR local population and 85% for the countries neighboring (Chad and Sudan) closed to eastern of CAR and set up the Seleka rebel mainly activity in the CAR since beginning of 2012 (see Fig. 7-1)

3.2.2 Companies holding exploration and exploitation permits

At the moment, all other companies that hold exploration or exploitation concessions in the CAR have suspended their activities. Most of them cite the global economic crisis as their main reason for not being present in the country. South of AXMIN's concessions, Tala Mining and Dimbi Diamants hold their exploration permits near the Congolese border. Tala Mining has been present in the country since March 2010. That year it contributed more than US$500,000 to the CAR's treasury. The company suspended its activities only a few months ago.

Dimbi Diamants had been in the country for a longer time. As a subsidiary of Pangea Diamondields, it was exploring the Dimbi project near Kembé, and the 2009 EITI report announced that industrial exploitation of diamonds was foreseen for the near future. In 2010, however, Pangea Diamondields went into liquidation and its concessions were taken over by IGE Resources AB. The latter deems Pangea's old CAR projects, Dimbi as well as Etoile, no longer relevant.

In the east of the country lies AREVA's 25-year uranium exploration and exploitation permit, near Bakouma. The company acquired the concessions in August 2007 when it bought the South African junior miner UraMin. In recent years, it was the most important source of tax revenues within the CAR's mining sector. In 2010, for example, it was responsible for 39% of the State's fiscal revenues from the sector. Since the beginning of this year, however, AREVA has suspended its activities in the country.

Most of the country's concessions are, however, located in the western part of the country. In 2011, Société Perrière acquired a three-year exploration permit for gold and diamonds near Boda. Likewise Kamach Mines also holds gold and diamonds exploration permit near Boda, however, like most others, it has also suspended its activities.

IV. HUMAN GEOGRAPHIC

4.1 Population

Central African Republic ended 2014 with a population of 4,709,203 people, which represents an increase as of 92,786 people compared to 2013. Central African Republic ranks No. 120 among196 countries which published this information in countryeconomy.com. The female population is greater, with 2,344,699 women, representing 50.79% of the total, compared to 2,271,718 or 49.21% men. Central African Republic is a country with a very low population density, with 8 people per square km and it was in position 13th in our ranking of density population in 2014.

According to the 2010 revision of the World Population Prospects the total population was 4 401 000 in 2010, compared to only 1 327 000 in 1950. The proportion of children below the age of 15 in 2010 was 40.4%, 55.6% was between 15 and 65 years of age, while 4% was 65 years or older.

There are more than 80 ethnic groups in the Central African Republic (CAR), each with its own language. About 50% are Baya-Mandjia, 40% Banda (largely located in the northern and central parts of the country), and 7% are M'Baka (southwestern corner of the CAR).

Period	Total population (x 1000)	Population aged 0–14 (%)	Population aged 15–64 (%)	Population aged 65+ (%)
1950	1 327	36.2	58.7	5.1
1955	1 399	37.0	58.3	4.7
1960	1 504	38.2	57.5	4.3
1965	1 649	39.6	56.2	4.2
1970	1 829	40.6	55.3	4.1
1975	2 017	41.7	54.2	4.1
1980	2 274	42.2	53.6	4.1
1985	2 627	42.4	53.6	4.0
1990	2 935	43.2	52.8	4.0
1995	3 328	42.5	53.5	4.0
2000	3 702	42.0	54.0	3.9
2005	4 018	41.6	54.5	4.0
2010	4 401	40.4	55.6	4.0

Table 4-1: Population statistic from 1950 to 2010

4.1.1 Cultural geographic context

The location and spread of ethnic groups in CAR was analyzed using the GREG dataset. This dataset this dataset identifies thirteen major ethnic groups in CAR and shows that the majority of the populations (80%) are Banda. When mapped in relation to the country's diamond deposits, it becomes clear that almost all of western and southeastern CAR's diamond deposits fall within Banda Territory (Fig. 4-1). In eastern CAR, the situation is more complex. Though the majority of deposits are found within the territory of the Banda, diamonds are also found within the territories of the Bagirmi and the Sudan Arabs, groups that make up 3.7% and 1.3% of the total population, respectively. Both groups have experienced incidences of conflict involving rebel groups.

Northeastern CAR has a long history of marginalization. The groups that inhabit this region are mostly Muslim, as opposed to the Christian national majority, and speak Arabic, rather than the national language, Sango. Many inhabitants of the northeast believe that their region has been purposely underdeveloped because of these cultural differences (Bauters, 2012).

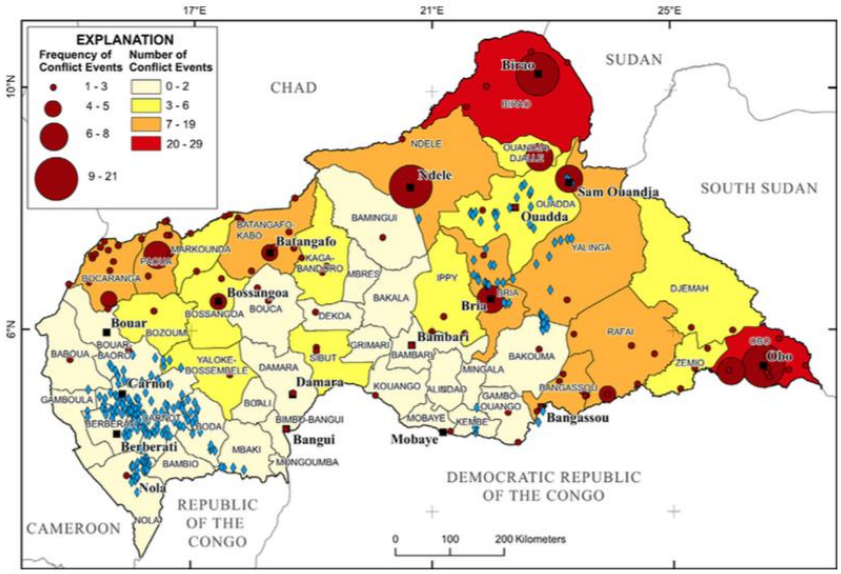


Fig. 4-1: The results of the population density analysis per sub-prefecture.

4.2 Economics activities

The economy of the Central African Republic is expected to grow slightly faster in 2015 after a 2014 marked by a positive return to growth, following the massive slump in 2013. The country remains, however,

marked by insufficient growth to ensure job creation – a situation which, however, already existed before the 2013 crisis and led to ubiquitous poverty (62% of the population) and alarming social indicators.

Subsistence agriculture, diamond mining, and forestry form the bulk of the economy of the Central African Republic. Burdened with poor infrastructure and high transportation costs, a largely unskilled work force, and poor economic policies, the Central African Republic is not a particularly attractive source for timber among African producers. Nevertheless, most of the country's forests have been logged for valuable tree species including sapelli, ayous and sipo. Most wood from the Central African Republic is exported to Europe.

Logging roads have opened up much of the Central African Republic to subsistence agriculture and poachers. Bushmeat hunting some of the most severe in Africa has taken a heavy toll on the country's once abundant and diverse wildlife. The black rhino is no longer present in the country due to poaching. Fuelwood collection has also put pressure on the Central African Republic's forests.

Deforestation and poor agricultural practices are resulting in desertification in the northern parts of the country.

The Central African Republic had one of the lowest total deforestation rates among tropical countries between 1990 and 2005 when just 1.9 percent of its forests were lost. However, the country's forest degradation rate was considerably higher due to logging.

Today about 16.6 percent of the Central African Republic is under some form of protection, though institutional support for protected areas has historically been weak, and hunters and loggers have continued to operate in national parks. The Central African Republic is home to about 3,600 species of plants, 663 birds, 131 mammals, 187 reptiles, and 29 amphibians.

V. PREVIOUS CAR GEOLOGY STUDY

5.1 Geology of CAR

Previous study By Peter G. and others (Report 2010). The underlying geology of the CAR consists mainly of basement rocks of Archean and Proterozoic age, which can be divided into two main geologic groups: a granitic-gneissic complex and a schist-quartzitic complex. The granitic-gneissic complex is probably of Neoarchean age and is composed of gneissic, granite, and amphibolitic rocks. Also included in this group of basement rocks is a series of sedimentary volcanic sequences that are typically referred to as "greenstones." Overlying the Archean basement rocks is the schist-quartzitic complex, which is thought to be of Neoproterozoic age and is composed of quartzitic and schistose rocks that are only weakly metamorphosed and generally folded. Both of these complexes are intruded throughout the country by basic rocks of Neoproterozoic age (Schlüter, 2006).

Overlying these older rocks is a sequence of Paleozoic rocks. The two major Paleozoic formations are the Mambéré Formation located in the western CAR and the Kombélé Formation located in the eastern CAR (Fig. 5-1). Both Paleozoic formations are of glacial origin. The Mambéré Formation is a tillite composed of both basal and low tills as well as reworked glacial deposits derived from sandstone, conglomeratic sandstone, and siltstone that occur in continuous beds, lenses, and isolated blocks (Censier and Lang, 1992). Similarly, the Kombélé Formation is a conglomeratic sandstone tillite composed of glacial-outwash plain sediments (Censier and others, 1992). Both the Mambéré and the Kombélé Formations generally range in thickness from 30 to 50 meters (m) and are covered by Cretaceous sandstone units lying unconformably above them. The exact areal extent of the Paleozoic rocks is not known because the more recent Mesozoic geology conceals a great deal of them. The Paleozoic units crop out in selected locations at the margins and in selected river valleys where the Mesozoic units have been completely eroded (Censier, 1996).

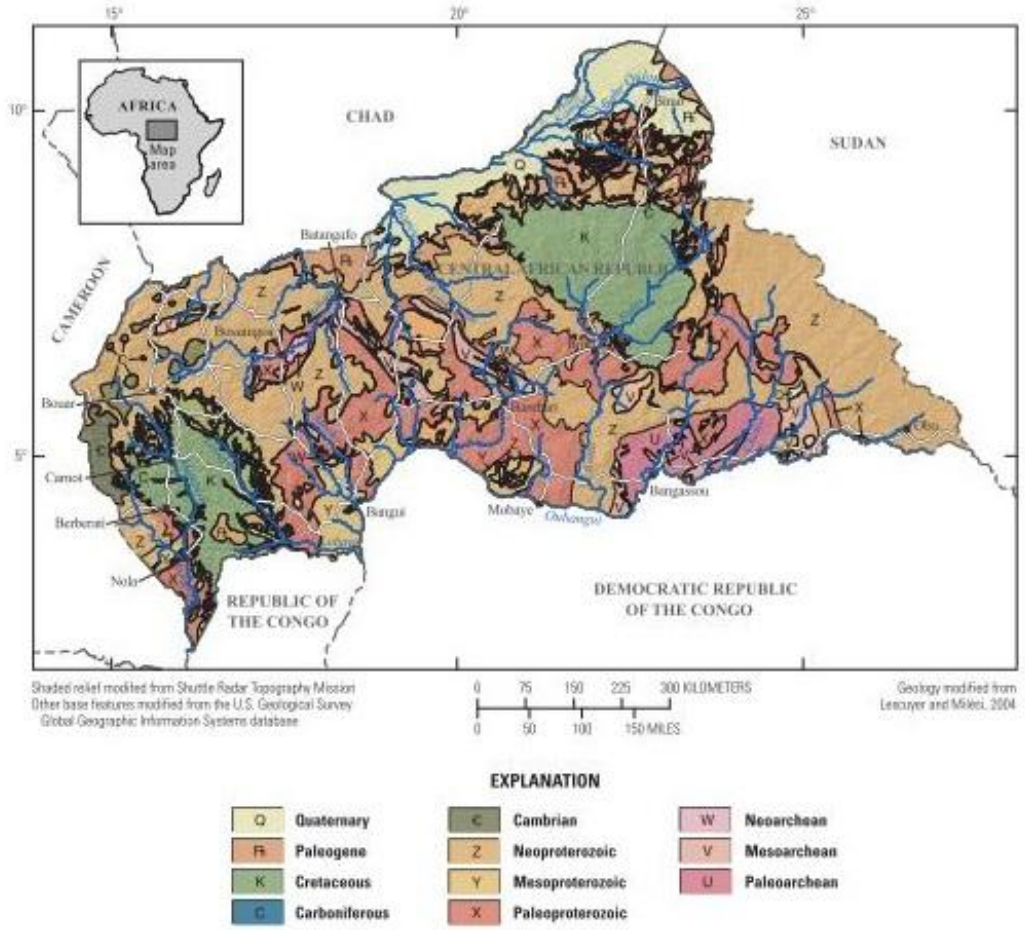


Fig 5-1: Geology of the Central African Republic

The Mesozoic, probably Cretaceous, fluvial sequences of conglomeritic sandstones concealing the Paleozoic glacial tillites form two distinct plateaus, one in the east and one in the west. The western plateau is made up of the Carnot Sandstone, and the eastern plateau is composed of the Mouka-Ouadda Sandstone. At one time, these two sandstone units extended much farther south and somewhat farther north than they do today. Later erosion of these two formations developed the current plateau landforms, which characterize the eastern and western CAR landscape (Censier and Tourenq, 1986; Censier, 1996). These two sandstone units are widely reported to be the secondary hosts of the diamonds in the CAR.

A series of Cenozoic rocks occurs in two distinct zones within the CAR. The first is a series Paleo-Tchadienne continental terminal sandstones extending north of Batangafo to the northern border of the CAR, forming smaller distinct plateaus. The second is the Bambio Sandstone, which is generally located between Nola and Boda just north of the Bangui River in the southwestern part of the country. The Bambio Sandstone lies atop the Carnot Sandstone but only covers an area of approximately 1,700 square kilometers (km²).

Recent Pleistocene deposits have filled in the northern basin and are generally divided into either Neo-Tchadienne alluvium or recent alluvial deposits. Quaternary alluvial deposits are also found in the many riverine floodplains throughout the country. Chemical weathering, which is typical in the humid tropical environment, has created lateritic duricrusts and ferricretes during the Quaternary. The weathering crusts may be as thick as 40 m in places and extend over large portions of the topography throughout the CAR (Petit, 1985; Beauvais, 1989; Beauvais and Roquin, 1996). (Chad) and into the Touboro Basin (Cameroon) (Censier and Lang, 1999). Subsequent uplift and faulting during the Cenozoic reversed the direction of low and erosion of the Carnot from north-northwest to south-southeast and emplaced the current fluvial drainage system.

VI. GEOLOGICAL CONTEXT

Diamonds occur in the Eastern part of the CAR in an area covered by Mouka-Ouadda Sandstones. These sandstones are considered to be the reservoir rocks comparable in age (Cretaceous?) and formation history to the Carnot Sandstones that form the most important diamond deposits of the CAR in the Western part of the country.

Fig.6-1: Diamond production areas in Eastern CAR. Hashed area represents occurrence of Mouka-Ouadda Sandstone Formation. Diamond deposits in zones 2-3-4-5-6 ("Bria") -7 and 8 share morphological characteristics. Diamonds increase in size and quality from North to South. Diamonds from deposits 9-10-11

("Dimbi") and 12 show stronger resemblance to diamonds from Northern DRC. Asteriks represent individual diamond deposits. Yellow circles indicate artisanal gold diggings (Map source: RCA (2009); DNG-BRGM-USGS).

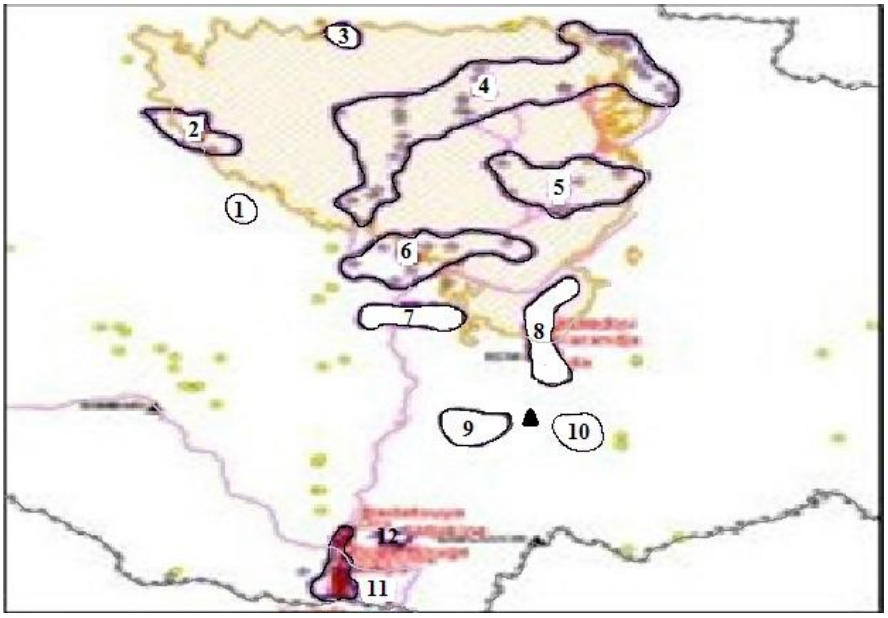


Fig 6-1: Diamond production areas in Eastern CAR.

	Description
Size	Avg. weight/stone: 0.7ct; 2ct common; >3-4ct less common; >10ct frequent; exceptionally ~100ct.
Crystal Morphology	Saweables (Octahedrons rare): 70-75% Makeables: 25-30% (incl. up to ~30% broken crystals). Mostly rounded, slightly flattened crystals with shiny surface. Many with (alluvial) Transportation damage.
Quality	~85-90%: High & Medium: Mostly greenish-yellowish, Greenish coatings common. Mostly commercial. Rarely colourless. Mostly cleanish. ~10-15%: Low: dark and heavily included crystals.
Value	Sam Ouandja: ~ 200$/ct; Bria: 200-250$/ct; Nzako: >300$/ct
Production Capacity	Sam Ouandja: ~ 10,000ct; Bria: 40,000-50,000ct; Nzako: ~ 5,000 - 7,500 ct

Table 6-1: Description of Diamond producing in Eastern area of CAR

According to study (Katherine C. Malpeli, Peter G. Chirico). CAR's eastern, southeastern, and western diamond deposits are similarly lootable according to the current definition of lootability. They are alluvial in nature, spread over vast areas, mined exclusively artisanally, and have a high value-to-weight ratio. These similarities are a result of their shared geologic history. While no primary source of diamonds has been discovered in CAR, the Carnot and Mouka-Ouadda Sandstone formations, located in western and eastern CAR, respectively, are thought to be secondary source rocks for the diamonds (see Fig.2-2 and 2-3). The deposits in southeastern CAR are also thought to be related to the sandstone formations, which have since eroded from this area. Only

remnants of the former plateau remain in the southeast (Censier, 1996; Chirico et al., 2010)

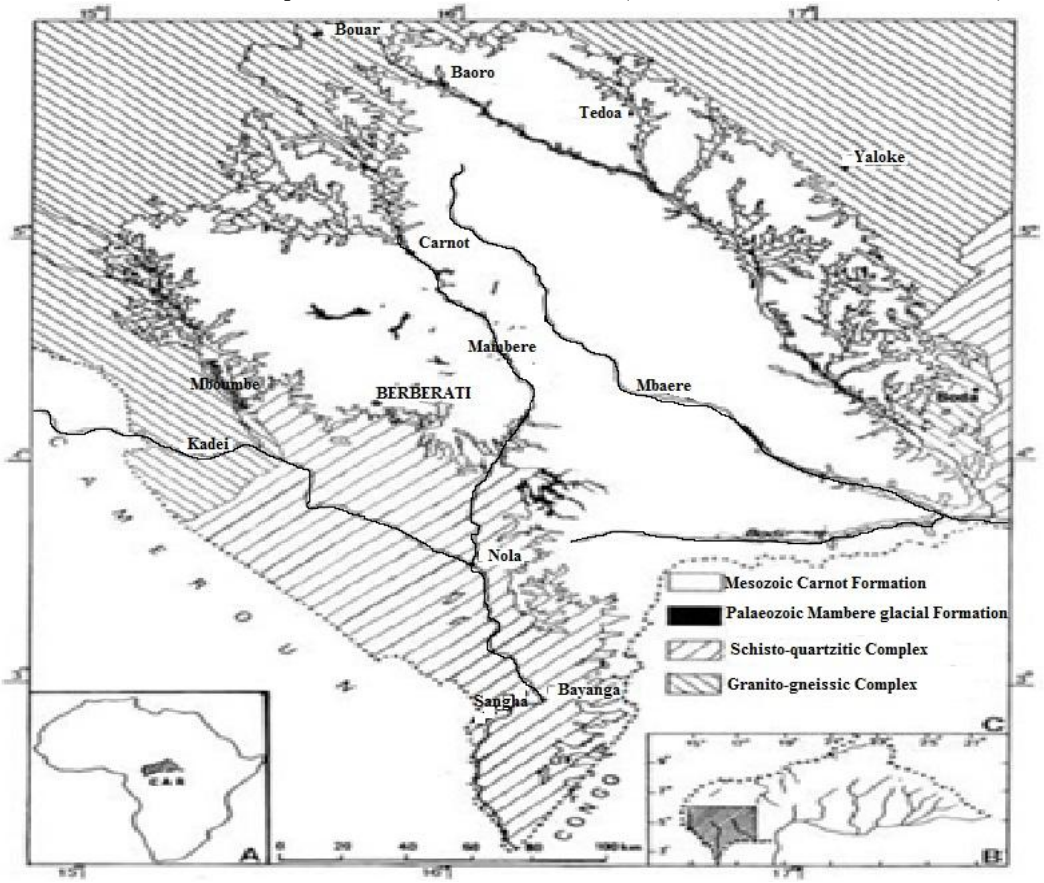


Fig. 6-2: Geological setting of the Carnot formation (Claude Censier, Jaques Lang 1999)

Watershed	Number of Cells	Cell Area (m^2)	Total Surface Area (m^2)	Average Gravel Thickness (m)	Total Alluvial Volume(m^2)	Volume of Deposit (ct/m^2) (2% of Total Alluvial Volume)	Concentration Grade (ct/m^2)	Concentration Reserves (ct/m^2) (2%)
Nola 1								
AF	50451	8402.77	211,964,074.64	0,8	169,571,259.71	3,391,425.19	0,60	2,034,855.12
AT		8402.77	211,964,074.64	0,2	42,392,814.93	847,856.30	0,20	169,571.26
Nola 2								
AF	13011	8402.77	54,664,220.24	0,8	43,731,376.19	874,627.52	0,60	524,776.51
AT		8402.77	54,664,220.24	0,2	10,932,844.05	218,656.88	0,20	43,731.38
Boda 1								
AF	99778	8402.77	419,205,792.53	0,8	335,364,634.02	6,707,292.68	0,60	4,024,375.61
AT		8402.77	419,205,792.53	0,2	83,841,158.51	1,676,823.17	0,20	335,364.63
Sub-Total								7,132,674.51
Estimated Historical Production								2,000,000
Total Resources Remaining 5,132,674.51								

Table 6-2: Western of the CAR's watershed details

Zone	Total Estimated Resources Volume Grade Approach (carat)	Total Estimated Resources Content per Kilometer Approach (carat)		Mean Total Estimated Resources (carat)
Country-level assessment				
Western Zone (Carnot)	29,227,742.00	36,990,718.65		33,109,230.33
Eastern Zone (Mouka-Ouadda)	27,235,608.30	26,916,727.00		27,076,167.65
	56,463,350.30	**63,907,445.65**	**Total Resources**	**60,185,397.98**
			Historical Production From 1991-2006	**21,000,000.00**
			Total Resources	39,185,397.98
PRADD Study Area Assessment				
Nola Watershed				**2,772,934.27**
Boda Watershed				**4,359,740.24**
			Sub-Total	**7,132,674.51**
Estimated Past Production				**2,000,000.00**
			Total Resources	**5,132,674.51**

Table 6-3: CAR western and eastern zone inferred and speculated Resources

Year	Volume (carats)	US$/carats	Value, US$
2004	348,205.16	148.50	51,709,404.00
2005	382,756.00	158.25	60,572,404.80
2006	419,528.35	140.79	59,066,866.49
2007	467,710.53	127.98	59,857,870.53
2008	377,209.12	126.59	47,752,281.70
2009	311,779.42	151.03	47,086,829.60
2010	301,557.62	162.13	48,892,376.57

Table 6-4: Production and value statistic of CAR

6.2 CAR diamond history and producing

Diamonds were discovered in the CAR in 1914 and again in 1929 when the widespread presence of alluvial diamond deposits was recognized (Dempster and Tutusaus, 1995). Commercial mining and production began in 1931 in the Bossangoa and Nola regions (western region) and rapidly expanded from 1935 to 1945. The alluvial exploitation of the eastern region expanded from 1943 to the present. Several mining companies exclusively exploited the diamond resources in the CAR from 1931 until 1960, and diamond production remained relatively low, averaging about 75,000 to 100,000 carats per year. In 1960, the Central African Republic gained independence and shortly thereafter, in April 1961, authorized the Bureau d'Achat to act as an organization of diamond export companies. In addition, the government of the CAR began licensing artisanal miners who, in turn, hired diggers to exploit the alluvial deposits. From 1961 through the early 1970s, production of diamonds increased rapidly from approximately 100,000 carats a year to approximately 450,000 carats a year. The increase was largely due to the authorization and introduction of artisanal miners working throughout the sector. Annual production of diamonds varies from year to year in relation to the seasonal environmental conditions, stability and security within the country, and the number of diggers employed in the sector.

As of 2006, there were 7 *Bureaux d'Achat and 18 Centre d'Achat* acting as buyers and diamond exporters. There are estimated to be approximately 300 *collecteurs* who purchase the diamonds locally from artisans close to the alluvial mining sites and resell them to the *Bureau d'Achat* for sale and export. There are 1,988 artisanal miners and 6,515 *ouvrier miniers* for a total of 8,503 artisanal miners. *Ouvrier miniers* are licensed artisans who work on smaller scales and pay less of a licensing fee than the other artisanal miners. Each artisanal miner hires

a team of diggers, which may range in size from 6 to 15 persons. There are also a few small-scale mining companies that operate in the CAR either through hiring diggers to exploit the deposits or by acting as buyers, *collecteurs*, and exporters.

It is estimated that between 50,000 and 100,000 diggers are exploiting alluvial diamond deposits in the CAR. Dietrich (2003) has reported the total number of licensed artisanal diggers as being approximately 50,000, while Censier (1996) reported an estimated 70,000. According to a 2003 unpublished report by Koyatro (Direction Générale des Mines), it is estimated that the total number of diggers is around 70,000 and that teams are typically constituted of approximately 10 to 15 diggers. Each team is hired and organized by a licensed artisan. Licensed artisans may sell diamonds either to a *collecteur* or directly to one of the registered diamond buying offices composing the Bureau *d'Achat. The collecteurs* may buy diamonds from many artisans and generally act as middlemen between the artisan and the *bureau* (Fig. 6-3).

In 1982, the *Bureau d'Evaluation et de Contrôle de Diamant et d'Or* (BECDOR) was established to officially value all diamond and gold exports. BECDOR assesses the value of all official diamond exports from the CAR and collects official statistics on diamond and gold production within the CAR. BECDOR also evaluates the receipts of sale from artisans and export companies operating in the CAR for all diamonds that they have purchased from artisans and mining societies. Each diamond sale is recorded through a series of receipts listed with the buyer's and seller's names and license numbers, in addition to carat, value, and place of origin of the diamonds.

Artisans and the teams of diggers that they employ utilize little if any mining technology beyond the occasional pumps. Most continue to use hand tools, sieves, jigs, and local timber and wood resources to perform the mining activities. There-fore, there are few barriers to entry for diamond diggers, as little or no training is required and basic tools are used. Often diggers move seasonally from site to site as new deposits are mined or as variations in the farming seasons occur.

While there are teams of 6 to 15 diggers typically employed by the artisans, there are often a number of ancillary workers at mine sites. These ancillary workers are usually family members of the diggers and include their wives and children. Women and children perform tasks such as transporting, washing, and sorting the gravel ore. Consequently, at a site where an artisan has a team of 10 diggers, there may be as many as 50 individuals working throughout all phases of the extraction and production process.

In addition, at some larger mine sites, women were observed cooking and selling food to the mine workers, operating independently of any specific digger family group. Markets may also be located close to the mine sites on certain days, developing a small-scale informal economy that may consist of all types of food and material sales and services. (Peter G. Chirico, and others 2010).

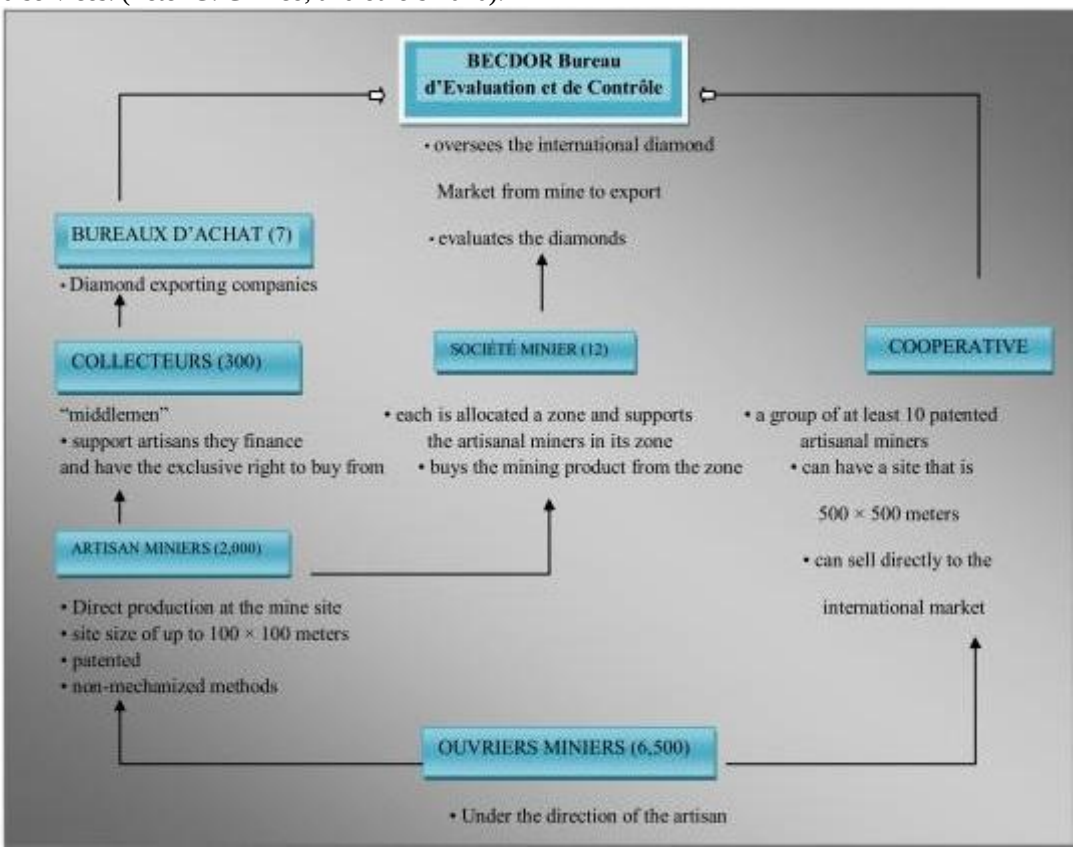


Fig. 6-3: Official diamond transactions, Central African Republic.

Diamonds and gold were discovered for the first time in the Central African Republic in the early twentieth century, when the country was still under French colonial rule. The colonial administration exerted strong control over access to the natural resources and granted concessions to private companies to exploit rubber, coffee, cotton and mineral resources. Diamonds soon became the CAR's second export product, after cotton.

International mining companies experienced their heyday in the CAR in the 1950s, with diamond production figures amounting to 147,104 carats in 1954. As these figures declined and exploration results lagged towards the end of the 1950s and early 1960s, mining companies confined their operations to the commercialization of minerals extracted from their concessions by artisanal miners.

During the colonial period, exploration exercises were carried out for gold and diamonds. After independence, however, international mining companies retreated from the country and investments in exploration disappeared. Diamond production, on the other hand, increased considerably after the end of colonial rule in 1960. The new Central African government liberalized the diamond sector, opening the mines to all citizens, which resulted in a rush to mining zones. Annual diamond exports consequently rose from 70,000 carats in 1960 to almost 537,000 in 1965.

After CAR's independence, successive rulers treated the country's mining sector as an important cash cow to sustain their patron-client network. Rulers would demand a share of production and impose high taxes on mineral exports. The most striking example is president/emperor Jean-Bédel Bokassa, who came to power in 1966. After an initial period of high production figures, diamond exports soon fell back because of Bokassa's greed, the exhaustion of the most easily exploitable deposits, and a lack of investment in new exploration. By the end of Bokassa's rule in 1979, production fluctuated at around 290,000 carats per year.

During the next decade, however, export statistics were revived once again with the introduction of a certiication system developed by the World Bank, the creation of the *Bureau d'évaluation et de contrôle de diamant et d'*or (BECDOR), the lowering of export taxes, and the tapping of deposits that are less easily exploitable. (Source by Ken Matthysen and Iain Clarkson 2013)

In 1994, the Central African Republic's mining industry remained dominated by the production and export of alluvial diamonds of gem quality and the production and export of gold. Indeed, diamonds were the most important commodity produced in the landlocked country, which remained 1 of the top 10 diamond-producing countries of the world. The mining sector of the Central African Republic has historically contributed about 4% of the Nation's gross domestic product (GDP), which was $2.5 billion in 1993. Increased production and export of diamonds were due partly to the Government's recent administrative and regulatory reforms with regard to the diamond sector (Source by Thomas P. Dolley, 1995)

In 2010, Central African Republic was ranked 14th among the world's leading producers of rough diamond, by volume, and 12th among the world's leading producers of rough diamond, by value. Comparing CAR's and Togo exporting and importing to the United States: Central Africa Republic's exports to the United States were valued at about $5.6 million in 2010 compared with about $3.4 million in 2009; rough diamond accounted for $3.3 million of these exports. Imports from the United States were valued at about $10.3 million in 2010 compared with about $31.4 million in 2009. This total included nearly $2.7 for drilling and oilfield equipment and $12,000 for excavating machinery. Production of gold and diamond, which was mostly artisanal, came from the regions of Berberati, Haute-Kotto, and Haute-Sangha. Data on diamond production are in table 6-6. (Source by Yadira Soto-Viruet 2010).

	2010	2011	2012 (January-June)
Diamonds (carats)	301,557.62	322,575.30	210,684.78
Source BECDOR (Bureau d'évaluation et de contrôle de diamante et d'or)			

Table 6-5: CAR, official diamond exports 2010-2012

6.2.1 Artisanal and industrial diamond producing

Diamond production supported an artisanal labor force of about 40,000, primarily in the riverbeds surrounding Carnot and Berberati, where the stones are more abundant, but of lower quality. Additionally, diamonds were mined at Bria. Diamond mining cooperatives also were present in the country. Officially, 9,052 miners were registered in 1992. The balances of the artisanal miners are subject to paying a license fee to the Government. The highest recorded diamond production, which started in 1925, was in 1968 at 636,000 carats. In 1994, Canada's United Reef Ltd., through their local subsidiary, Howe Centrafrique Ltd., was the sole foreign company actively mining diamonds.

Commodity 3/		1990	1991	1992	1993	1994 e/
Diamond						
Gem	carats	303,000	206,000	302,000	370,000	400,000
Industrial	do.	78,000	82,000	102,000	125,000	131,000
Total	do.	381,000	379,000	404,000	495,000	531,000

Table 6-6: CAR, production of diamond commodities

Togo's exports to the United States were valued at about $9 million in 2010 compared with about $6 million in 2009. Imports from the United States were valued at about $170 million in 2010 compared with about $125 million in 2009. These included nearly $32 million of petroleum products, $3 million of excavating machinery, and $127,000 of drilling and oilfield equipment.

Countries	Commodities		2006	2007	2008	2009	2010
CAR	Diamond[5]	carats	419,528[4]	467,711[4]	377,209[4]	311,779[4]	301,557[4]
TOGO	Diamond	carats	28,176[4]	17,362[4]	8,787[4]	125[4]	96[4]

Table 6-7: CAR &Togo, comparing estimated production of diamond commodities

Countries	Greenstones	Industrial diamonds	Total
Angola	12,500	1,300	13,800
CAR	250	60	310
DRC	5,500	22,200	27,700
Source: Olson D. W. 2010 minerals Yearbook: Diamond, Industrial, USGS, June 2012			

Table 6-8: Central African 2012 diamond production, thousand carats.

Diamonds are almost exclusively extracted by artisanal means in the CAR. According to accumulated diamond export figures since 1931, more than 84% of extraction is produced artisanally. Since independence, industrial exploitation has almost completely disappeared.

In order to legally join the artisanal mining sector, there are a few possibilities. With a miner's card (carte d'exploitant artisan minier), miners are permitted to operate in designated artisanal mining zones, which are demarcated by the government' mining administration. So far, however, not a single artisanal mining zone has been designated. In case a miner wants to obtain a title outside of a designated artisanal mining zone, he should also apply for a prospecting- or artisanal mining exploitation license.

The CAR's diamond mining sector involves mainly small alluvial deposits - in rivers and riparian areas - which are especially it for artisanal mining. The southwest of the country is the area most densely populated by artisanal miners. It involves the prefectures of Nana-Mambéré, Mambéré-Kadéï Sangha-Mbaéré and Lobaye. The deposits are spread along the Mambéré, Lobaye, Sangha and Kadeï rivers. Important mining zones include Berbérati, Carnot, Nola, Boda, Salo, Bouar and Bozoum.

A number of other key mining sites can be found in the centre-east prefectures Ouaka and Haute-Kotto, along the Kotto River. Mining areas are centred around Bria, Ippy, Dimbi, Bambari, Bangassou, Ndélé and Sam-Ouandja.

The southwestern zone produces more diamonds than the east - an estimated 80% of total production - but they are smaller in size. Historically, the upper-Sangha region has accounted for about 60% of the CAR's diamond production. The east's lower official production might be partly explained by the fact that bigger diamonds are a more alluring candidate for smuggling and the government's relatively limited control over its eastern territory.

In the above-mentioned mining areas, ASM offers an important livelihood strategy for local communities. It is an attractive employment opportunity in impoverished, rural areas as it requires very little capital, knowledge and technology. Furthermore, it is labour intensive and consequently an important provider of employment opportunities, providing cash income that helps to pay for healthcare, education for children, and construction of infrastructure.90 The artisanal mining sector employs an estimated 80,000 to 100,000 miners; 600,000 people - 13% of the country's population sector for their income.

In order to make a living, many people in rural areas combine mining with other economic activities such as subsistence agriculture and fishing. During the rainy season in particular, from May/June to October/November, there's a fall back in mineral production, and miners have to rely more on alternative sources of income.

In the 1980s and 1990s, however, many households started to rely more exclusively on artisanal diamond mining for their daily income. Consequently, it increased their dependency on the mining sector and made them more vulnerable to shocks. Such shocks occurred several times during the first decade of the century: political

instability because of a failed coup in 2001, the overturn of Patassé, the closing down of several mineral buying offices in 2008 and the fall of diamond prices on the world market.

Because of the crisis within the diamond sector, it appears that increasing numbers of people are willing to leave artisanal mining behind, as revenues from diamond mining are often no longer sufficient to provide basic necessities. Many people have therefore decided to return (partly) to agriculture in order to make more money and to secure their own food supply (Ken Matthysen and Iain Clarkson. 2013).

Mining buying offices in CAR	2010	2011	First half of 2012
	Diamonds	**Diamonds**	**Diamonds**
BADICA	83,161.18	93,449.41	74,061.70
SODIAM	145,240.01	131,222.96	75,184.61
ADR	72,298.35	65,423.25	26,222.97
INALA	517.65	392.98	0,00
SINO SANGO		20,595.30	27,097.93
ADAMAS-SWISS			
SUD AZUR		10,776.23	7,386.59
IAS		3.01	536.61
ANANT EXIM			
COMIGEM		446.94	0.00
UNCMCA (cooperatives' union)	340.43	1,265.22	194.37

Table 6-9: Diamond (carats) exports per buying office, 2010-2012 (Source: BECDOR)

Appendix 6-1: B. 53-carats rough diamond being evaluated at BECDOR in Bangui prior to export, July 2008

6.3 CAR forest and deforestation

Many parts of Africa have been deforested by the expansion of agricultural land. This loss of trees has many detrimental effects. Soil erosion increases because trees no longer block wind and their roots no longer hold soil together. Soil fertility decreases because the input of nutrients in the form of organic matter like leaves from trees vanishes. Renewable sources of fuel and building materials are lost when trees are removed to convert land to agricultural landscapes.

Deforestation and poor agricultural practices are resulting in desertification in the northern parts of the country.

The Central African Republic had one of the lowest total deforestation rates among tropical countries between 1990 and 2005 when just 1.9 percent of its forests were lost. However, the country's forest degradation rate was considerably higher due to logging.

Today about 16.6 percent of the Central African Republic is under some form of protection, though institutional support for protected areas has historically been weak, and hunters and loggers have continued to operate in national parks. The Central African Republic is home to about 3,600 species of plants, 663 birds, 131 mammals, 187 reptiles, and 29 amphibians.

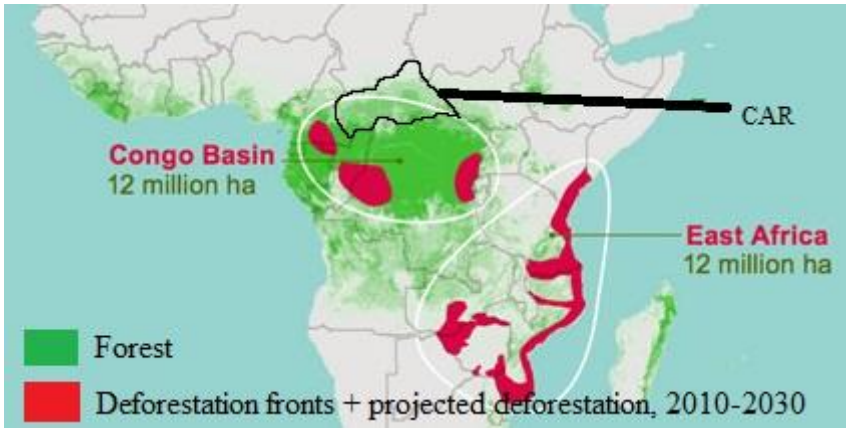


Fig. 6-4: Map of deforestation fronts

Central African Republic
Deforestation Rates, 2000-2005
Annual change in forest cover: -29,600 ha
Change in defor. rate since '90s: n/a
Total forest loss since 1990: -448,000 ha
Total forest loss since 1990:-1.9%

Table 6-10: Central African Republic Forest Figures

VII. CONFLICT LINKED TO TIMBER AND DIAMOND IN CAR

7.1 Complicity of logging companies in funding CAR's conflict

The relationship between natural resources and conflict is still poorly understood by the international community, though the link is now routinely recognized in UN resolutions. According to Interpol and the United Nations Environment Programme as many as 40% of intrastate conflicts over the past sixty years have been linked to natural resources. Conflicts involving natural resources last longer and have a greater chance of reigniting after resolution than other types of conflicts. Lessons relating to the natural resource dimension of conflict are still to be properly consolidated for the design of resource-sensitive conflict prevention, transition and post-war reconstruction strategies. This is particularly pertinent to CAR, a country extremely rich in natural resources (bearing diamonds, gold, timber, oil and uranium), which remains one of the poorest countries on earth, having suffered violent unrest and numerous coups d'état since independence in 1960. Its natural resource wealth has been at the centre of competing claims for power, but the relationship between natural resources and the country's repeated conflicts has been barely examined until recently. Timber is one of CAR's most prized industries, harvested in part of the world's second largest rainforest. As this report shows, it has not been spared the attentions of armed groups.

Understanding of the phenomenon of "conflict timber" has evolved as cases have garnered international attention 1% over the past twenty years. The timber trade has financed conflict while fuelling corruption and illegality in many countries, notably Cambodia, Ivory Coast, Myanmar and Liberia.

Global Witness – an organization that has worked on breaking the links between timber, conflict and corruption for over twenty years – has found that during the Seleka's rule, Chinese, French and Lebanese companies continued to log CAR's rainforest at scale and for significant profit. Despite thousands of innocent civilians being tortured and murdered by the Seleka, international timber traders, in particular those in Europe and China, continued to sell and trade Sapelli, Sipo, Iroko and other Central African wood species. Logging companies were able to continue operating and exporting thanks to lucrative financial arrangements concluded with Seleka leaders, by which they paid an estimated EUR 3.4 million in total, for example for "protection" services, allowing the Seleka to maintain armed rebels on the ground and procure weapons.

Since then, despite the rout of the Seleka in 2014, these companies have continued to contribute to the country's instability, by making an estimated EUR 127,864 in payments to "anti-balaka" militias, the Seleka's successors in CAR's forested areas. Though the sums are lower than in the Seleka period, they still help the anti-balaka maintain their presence in the forested South-West.

These logging companies have financed groups who have committed the worst kind of human rights abuses. They should be held responsible as accessories to the crimes of their protectors. (Global Witness. Blood Timber, July 2015)

Appendix 7-1: CAR logs image taken in Cameroon, China and France, 2014

7.2 CAR's diamond linked to the conflict

CAR is one of the world's least developed countries, ranking 180 out of 187 countries in the 2012 United Nations Development Programme's Human Development Index (Malik, 2013).The recent government takeover in CAR follows a turbulent history of political instability, defined by a series of coups and attempted coups and the formation of multiple armed rebel groups. Prior to the formation of the Seleka rebel group in 2012, three principle groups were operating in CAR: the Popular Army for the Restoration of the Republic and Democracy (APRD), the Union of the Democratic Forces for Unity (UFDR), and the Convention of Patriots for Justice and Peace (CPJP) (Bauters, 2012; Spittaels and Hilgert, 2009). In September 2012, the UFDR CPJP, and a third group, the Wa Kodro Salute Patriotic Convention (CPSK), aligned to form the Seleka rebel group (ICG, 2013).

Members of the Ugandan-based Lord's Resistance Army (LRA) have also been operating in CAR since 2008, primarily in the southeast (Bauters, 2012).

Complicating this unstable political situation is the fact that CAR is home to extensive alluvial diamond deposits. The Deposits are principally located in the southwest (hereafter referred to as the western zone deposits) and northeast (hereafter referred to as the eastern zone deposits), and in a smaller zone in the southeast (Fig. 1-2). CAR is the world's 12th leading producer of rough diamonds in terms of value and diamonds represent 40% of the country's total export revenues, with production fluctuating between 300,000 and 450,000 carats since the late 1960s (KPCS, 2013b). While CAR is a relatively minor producer in terms of volume, the quality of the diamonds is exceptionally high.

Diamond production in CAR has been nearly exclusively artisanal in nature since independence in 1960, with miners extracting stones using only rudimentary tools and techniques. Artisanal mining is frequently perceived as an attractive livelihood option by impoverished populations due to its low entry barriers and potential for high earnings. However, it is also associated with a high degree of uncertainty, as miners lack efficient exploration techniques and often operate largely by guesswork (Jønsson and Fold, 2011). It is estimated that there are approximately 60,000–90,000 miners operating in CAR (Bermudez-Lugo, 2011; Chirico et al., 2010). It is important to note, however, that estimating the number of artisanal miners in a particular region or country is a challenging task, due to factors such as the transient nature of miners, poor record-keeping by mine managers, and the informality of the sector (Heemskerk, 2001). It is made even more difficult in countries such as CAR, where political instability and open conflict are widespread.

Conflicts are typically diffuse, persistent, and sub-national in nature, and are usually the result of an unequal distribution of resources, issues of resource control, and the failures of institutions to adequately manage them (Homer-Dixon, 1994; Turner, 2004). Collier and Hoeffler (1998, 2004) were among the earliest researchers to suggest a significant link between resource abundance and the risk of civil war onset. Alluvial diamonds are the secondary resource most commonly represented by the conflict resources argument, and are also the focus of this study. A study by Lujala et al. (2005) was the first to concentrate on the specific role of diamonds in conflicts. The authors found that the effect of diamonds on the incidence of civil war depends on two principle actors: the level of existing ethnic fractionalization and the geologic nature of the deposits. Secondary diamond deposits were found to be positively related to the occurrence of civil war, in particular in countries with ethnic fractionalization.

Previous case studies have established that some resources appear to have stronger links to conflict than others and that resource abundant countries have had different experiences with respect to conflict (Auty, 2004; Le Billon, 2008; Lujala et al., 2005; Samset, 2002; Silberfein, 2004).

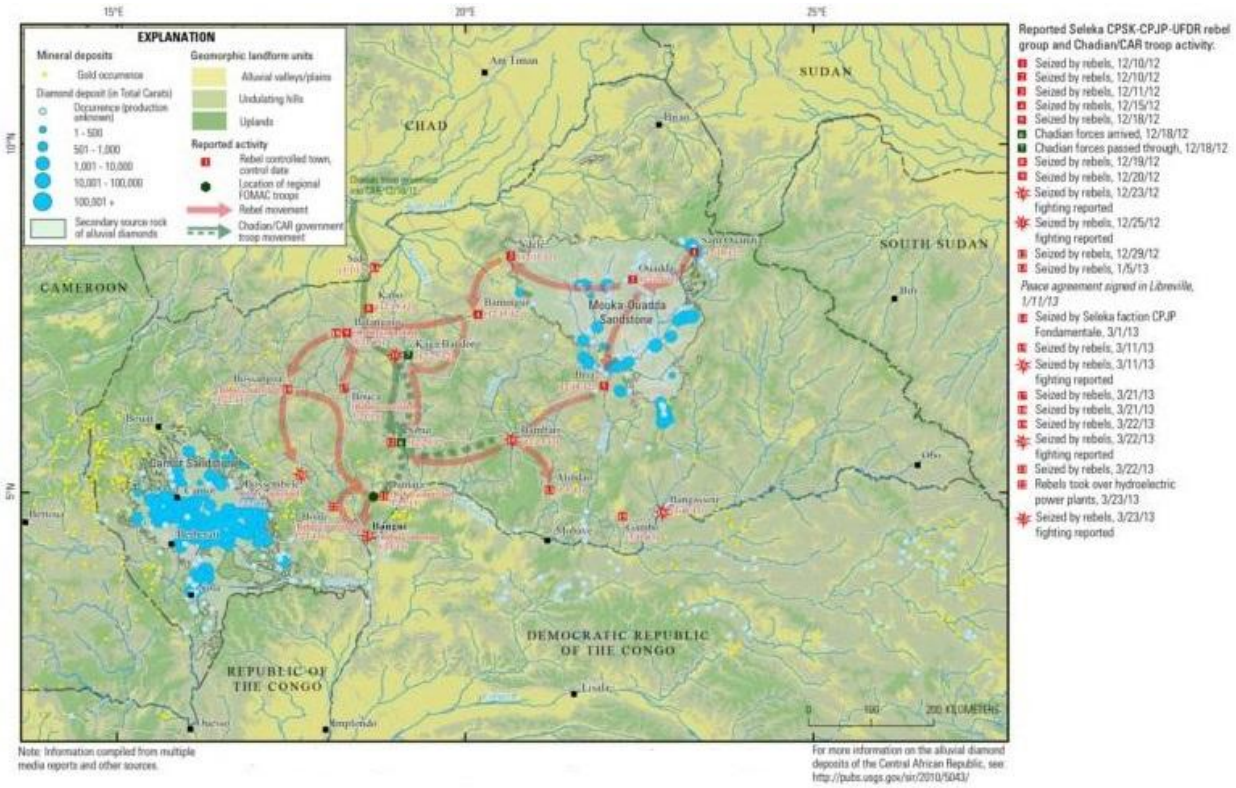


Fig. 7-1: Map of the diamond deposits and Seleka rebel activity in the CAR as of 3/23/13

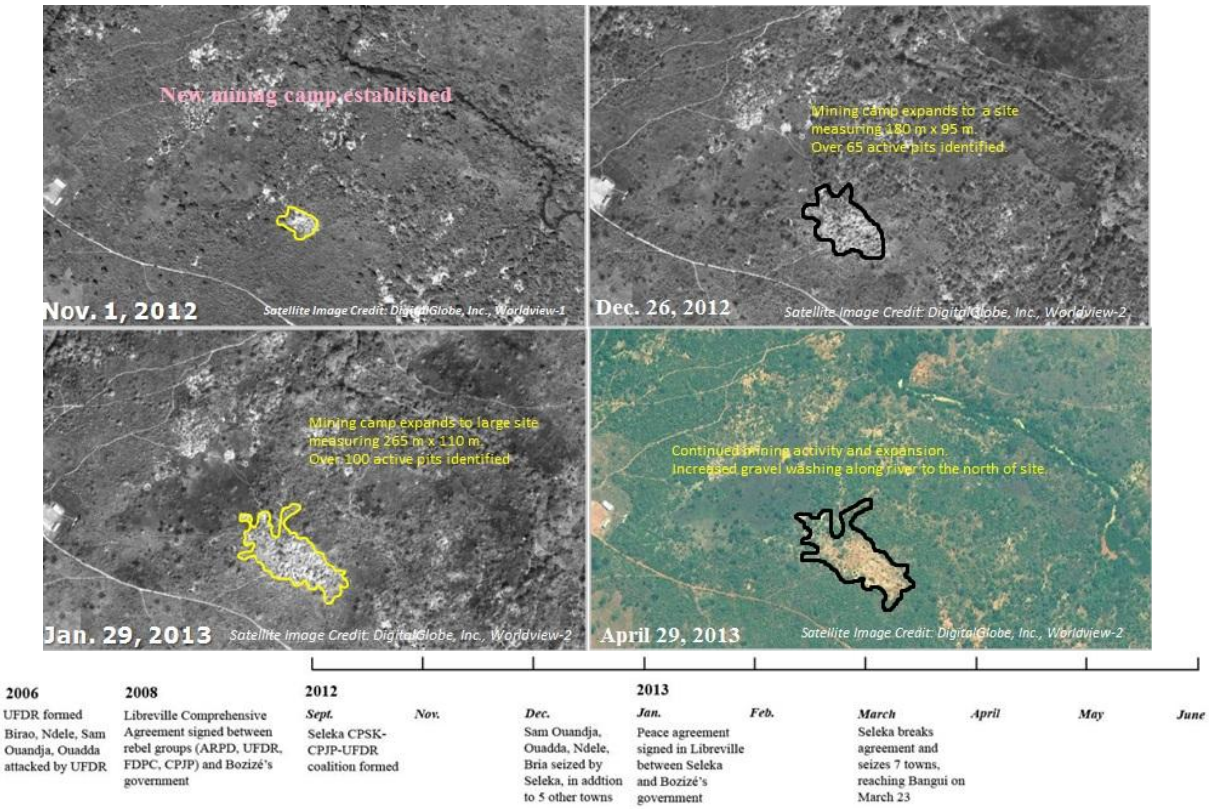


Fig. 7-2: CAR Monitoring: Sam Ouandja terrace mining and washing site

VIII. INTERNATIONAL SOLUTION ON FOREST AND DIAMOND PRODUCING IN CAR

8.1 Logging industry

Finally, the EU assigns the logging industry and its trade a role which should not be theirs. At the time the VPA was signed, the European Commission said that it aimed "to prevent illegal wood imports to EU from Central African Republic and to boost the country's timber sector". Today, the Commission justifies its decision to resume FLEGT-VPA implementation with CAR, by saying that it is "a means to understand the current state of the forest sector and how this sector can contribute to stabilizing the country towards a strong peace-building process". But is it really appropriate to "stabilize" CAR by supporting the logging sector, when it is implicated in the financing of armed groups? Equally, is it wise, considering their track record and antecedents, to invite logging companies as "stakeholders" to meetings to reform CAR's forestry sector, as the EU did in 2014 in Bangui or in March 2015 in Brussels? Is treating logging companies, which funded armed groups, as actors and partners in policy-making processes not a way of perpetuating impunity?

Today, it is no longer possible to showcase the industrial logging sector as an important or indispensable lever in CAR's economic and social development, as the EU continues to do. The latter appears to believe that it is not possible to ignore the sector, because of its role in CAR's economy: it officially employs 2,175 people (down from 4,000 previously), and has fiscal revenues in the order of EUR 3.7 million per year. However, the Kimberley process suspended CAR, despite the diamonds sector employing 400,000 people and bringing in EUR 6.2 million in tax revenues.

In fact, the EU has not properly evaluated the real impacts or contribution of the timber industry. For a correct appraisal, you would need to take account of the costs of corruption in the sector, the resulting weakening of CAR's state and the rule of law, the environmental impacts of its activities, its impact on land and customary rights, access to land and forest resources of local and indigenous communities and obviously also the industry's willingness to support armed groups and illegitimate power-holders.

CAR is confronted with huge peace-building and reconstruction challenges. Breaking the links between the exploitation of natural resources, conflict and corruption, which damages the long-term viability of peace, development and stability, is the biggest of these challenges. The cycle of coup and counter- coup, misappropriation of natural resources and destruction of environments and endangered species, must stop. CAR deserves international support to reach these objectives, including debt reduction and significant budgetary support. (Global Witness. Blood Timber, July 2015)

8.2 Kimberley process in CAR

8.2.1 Creation of Kimberley process and its goal

During the late 1990s the issue of "conflict diamonds," or "blood diamonds," became increasingly recognized by the global community, largely due to civil unrest and wars in Sierra Leone and in Angola.

In May of 2000, a meeting was convened in Kimberley, South Africa, and attended by representatives of the diamond industry and leaders of African governments to develop a certification process intended to assure that rough, exported diamonds were free of conflictual concerns. This meeting was supported later in 2000 by the United Nations in a resolution adopted by the General Assembly. By 2002, the Kimberly Process Certification Scheme (KPCS) was ratified and signed by diamond-producing and diamond-importing countries. Over 70 countries were included as members of the KPCS at the end of 2007.

The KPCS is an international activity whose goal is to prevent trade in conflict diamonds while helping to protect legitimate trade through monitoring of the production, exportation, and importation of rough diamonds throughout the world. To accomplish this task, the KPCS requires that each country set up an internal system of controls to prevent conflict diamonds from entering any imported or exported shipments of rough diamonds. Every diamond or diamond shipment must be accompanied by a Kimberley Process (KP) certificate and be contained in tamper-proof packaging. The certificate includes an export origin section, an import verification section, and a security slip. The KP also requires that no diamonds be imported from or exported to a nonmember of the KPCS. Additionally, a recommendation of the KPCS is that all artisanal miners and buyers within a country should be licensed by the host government (Olsson, 2006).

Countries that are members of the scheme are required to report their official amount of diamond imports and exports, as well as the value of the diamonds each year to the KP.

8.2.2 Chair process

The Chair oversees the implementation of the Kimberley Process Certification Scheme, the operations of the working groups and committees, and general administration. The Chair rotates annually. The Vice Chair is selected at the annual 'plenary' meeting and becomes Chair automatically the following year.

Years	Kimberley Process Chairs	Vice Chairs
2015	Angola	
2014	China	Angola
2013	South Africa	People's Republic of China
2012	The United States of America	South Africa
2011	Democratic Republic of Congo	The United States of America
2010	Israel	Democratic Republic of Congo
2009	Namibia	Israel
2008	India	Namibia
2007	The European Union	India
2006	Botswana	The European Union
2005	The Russian Federation	Botswana
2004	Canada	The Russian Federation
2003	South Africa	Canada

Table 8-1: Kimberley Process Chair 2003-2015

8.2.2.1 Kimberley Process Administration Decision on CAR

The Plenary further noted ongoing WGDE efforts to support the implementation of the Central African Republic (CAR) KP roadmap and to implement the Administrative Decision on CAR (July 2014). The Plenary welcomed the export of a rough diamond shipment from CAR to South Africa to update the CAR footprinting analysis and work on a fingerprinting analysis. The Plenary looks forward to the results of this research analysis expected in March 2015.

8.2.2.2 Temporary Suspension on CAR

Behind the CAR conflict link to diamonds, according to the Twelfth Kimberley Process (KP) Plenary Meeting convened from November 11-14, 2014 in Guangzhou, The People's Republic of China some decisions had been taken. To know:

In light of the AD on the Central African Republic (CAR) [Temporary Suspension] as approved through written procedure on 23 May 2013 and the AD on ensuring that diamonds from CAR are not introduced into the legitimate trade as approved through written procedure on 11 July 2014, the Plenary took note of the progress made by CAR on implementation of its Work Plan and roadmap for addressing issues of non-compliance with KPCS minimum standards and strengthening the internal control system. Also the

Participants and Observers to the Kimberley Process Certification Scheme (KPCS), meeting in regular Inter-sessional format in Shanghai on 9-12 June 2014, devoted special attention to illicit trafficking of diamonds from the Central African Republic (CAR).

The Plenary encouraged CAR's KP authorities to continue implementing its Work Plan and share any relevant information and data directly with the appropriate KP working bodies. The Plenary also encouraged CAR to continue working closely together with the African Union (AU), relevant United Nations bodies - notably the Panel of Experts established pursuant to UNSC Resolution 2127 (2013), the international community and neighboring countries on KP compliance issues with a regional dimension. The Plenary invited the WGM to proceed with the planning of a Review Mission, in line with the AD on the Central African Republic (CAR) [Temporary Suspension] as approved through written procedure on 23 May 2013.

The Plenary requested Participants to consider providing technical assistance to CAR and its neighboring countries, with a view to enhancing their capacity and strengthening their internal controls over diamond production and trade (Kimberley Process Plenary Meeting 2014).

Other report noted that: Having regard to the enhanced Vigilance Notice on the CAR as issued by the KP Chair on 18 April 2013, the Plenary notes that pockets of rebel groups are operating in the Eastern part of the country including in a number of diamond-producing areas around Sam Ouadja, Bria and Bamingui and decides that the information reviewed could constitute non-compliance with the minimum requirements of the certification scheme, in particularly Section IV of the KPCS document, according to which each Participant should "establish a system of informal controls designed to eliminate the presence of conflict diamonds from shipments rough diamonds imported into and exported from its territory". Due consideration is given to the fact additional verification measures are currently not feasible give to security situation on the ground.

Appendix 8-1: An official KP Certificate accompanying a diamond shipment from CAR

IX. CONCLUSION AND SUGGESTION

The goal of this study was to focus on forestry and diamond linked to the conflict in the CAR. The mining sector is constituted an important source for an estimated 600.000 person. Mining sector is the third economic activity after Agriculture and Forestry. According to its third places after Agriculture and Forestry, mining sector is taken the first place linked to the conflict accompany to the forestry in the CAR. Always its link to the conflict is joined to the technical problem such as inequality sharing on the resources producing, ethnic, nongovernment of state, insecurity increasing and so on.

In general the risk forestry link to the conflict is lower than mining sector in the CAR. Following to the last conflict began in 2012 in the CAR; we suggested that to avoid the same situation in the future. The government must be working hard to make down the risk of the conflict linked to the mining sector and forestry, and to have more attracting of local and international partner legal to invest in mining sector or forestry. The CAR government must set up a high level of the security in the country, at the country bordered and also judiciary security, all these factor can guarantee mining sector and forestry to partner investment. The absence of the state in rural CAR has resulted in political instability across the country.

Agriculture is the primary economic activity in the CAR; more than 70% of citizens are engaged in subsistence farming and agriculture represents 54% of the country's Gross Domestic Product (GDP). With its vast forests, logging is the country's second key economic activity. The export value of the forestry sector narrowly outruns that of the diamond sector, earning the country respectively $52.3 million and $49.3 million in

2009, or 42.2% and 39.8% of the country's total export value. The mining sector in total accounted for 7% of GDP in 2007, and fiscal revenues from the sector came to 9% and 11% of the State's total fiscal revenues in 2009 and 2010 respectively.

Export values demonstrate that diamonds are by far the country's principle mineral. In 2011, the CAR officially exported 323,575.30 carats, worth CFA 29.7 billion, or $61.4 million. Official gold exports were only 72.8 kg, which equated to an export value of CFA 1.25 billion.

However, the CAR's diamond production volume is still far below that of the Central African region's other top producers, the Democratic Republic of the Congo (DRC) and Angola. The DRC and Angola produced 27.7 and 13.8 million carats respectively in 2010, which clearly overshadows the CAR's 310 thousand carats (table 6-7). The regions' other diamond producers are Cameroon, the Republic of Congo and Gabon, however the precise production outputs for these countries are unknown

In terms of quantity, the CAR is therefore a relatively minor diamond producer compared to Angola and the DRC. The quality of diamonds is however quite a different matter (table 6-7). While the DRC mainly produces industrial diamonds, 80% of the CAR's diamonds are gem quality. In order to have an idea of the difference in quality, Barthélémy compared the average prices per carat in 2008. The average price per carat was $30 in the DRC, $150 in Angola, and $180 in the CAR. The quality of the CAR's diamonds ranks fifth in the world.

The situation today is much more nuanced. Despite some links between the country's minerals and insecurity, and the fact that some conflict actors occasionally gain profit from CAR's natural resources, these resources should not be regarded as a conflict motivator.

X. Acknowledgements

I would like to show my special gratitude to my family, who supports my absence during the period of my study in China.

I also would like to thank my brothers and my special family Miguel Cyriaque. BASSANGANAM, Smith Marc. Nelson BASSANGANAM, S. P. Olga, H. Romaric, S. P. M. Serge, A. Nego, Y. C. Junias, K. F. Cirus, M. Passi, S. Junior, S. Benicia and J. P. Gandi in law for their support during my study in China.

Finally I would like to thank my supervisor Ph. D Yang Mei Zhen, for her guidance and assistance for my studies.

REFERENCES

[1]. Smillie, I., Gberie, L., Hazleton, R., 2000. The heart of the matter: Sierra Leone, diamonds and human security. Partnership Africa Canada, Ottawa.

[2]. Le Billon, P. (2001a). Angola's political economy of war: the role of oil and diamonds 1975–2000. African Affairs, 100, 55–80.

[3]. Samset, I., 2002. Conflict of interests or interests in conflict? Diamonds and war in the DRC. Rev. Afr. Polit. Econ. 29 (93–94), 463–480, http://dx.doi.org/10.1080/ 03056240208704633

[4]. United Nations Security Council (UNSC), 2005. Resolution 1643 (2005): Adopted by the Security Council at its 5327th meeting, on 15 December 2005. United Nations Security Council Press Release, New York. December 15, 4 p. Available at http://www.sipri.org/databases/embargoes/eu_arms_embargoes/cote/un- security-council-resolution-1643-2005 (accessed 31.07.13).

[5]. United Nations Security Council (UNSC), 1992. Resolution 788 (1992): Adopted by the Security Council at its 3138th meeting, on 19 November 1992. United Nations Security Council, New York. November 19, 3 p. Available at http:// www.un.org/en/ga/search/view_doc.asp?symbol=S/RES/788 (1992).

[6]. Ken Matthysen and Iain Clarkson, 2013, Gold and diamonds in the Central African Republic; The country's mining sector, and related social, economic and environmental issues, International Peace Information Service, Antwerp.

[7]. Reports Database. Annual Reports; Congo Brazzaville Annual Reports (Phase 2) by Forests Monitor, REM and CAGDF 2010-present Français. Congo Brazzaville Annual...

[8]. Chirico, P.G., Barthelemy, F., Ngbokoto, F.A., 2010. Alluvial diamond resource potential and production capacity assessment of the Central African Republic: In: U.S. Geological Survey Scientific Investigation Report 2010-5043.

[9]. Censier, C., 1990. Characteristics of Mesozoic fluvio-lacustrine formations of the western Central African Republic (Carnot Sandstones) by means of mineralogical and exoscopic analyses of detrital material. J. Afr. Earth Sci. 10 (1–2), 385+/–398.

[10]. Censier and Lang, 1999.Palaeogeography (specifically palaeotopography and palaeobathymetry) ... Sedimentary processes in the Carnot Formation.

[11]. Asselberghs, E., 1934. Sur l'extension du système du Karoo dans la région de Carnot (A.E.F.) et dans la région de l'Ubanghi. Bull. Soc. Géol. Belg. 44, 338–342.

[12]. Babet, V., 1948. Exploration géologique et minière de la Haut Sangha et de la région de Bouar-Baboua. Bull. Serv. Min A.E.F. 4, 110 pp.
[13]. Borgniez, G., 1935. Esquisse géologique de l'Oubangui-Chari occidental et des régions voisines. Chron. Min. Col., Paris 44,354–372
[14]. Babet, V., 1935. Sur les grés horizontaux de la Haute Sangha (Afrique Equatoriale Française). Bull. Soc. Geol. Fr., 5eme ser., 5, 455–463.
[15]. Delany, F., Delorme, J., 1956. Etude préliminaire de la série argilo-gréseuse de la région diamantifère de l'Ouest-Oubangui. C.R. 20me Congr. Int. Geol., Mexico, Commission Gondwana, pp. 65–72.
[16]. Berthoumieux, G., Delany, F., 1957. Mission Diamant dans l'Ouest-Oubangui. Bull. Dir. Min. Géol. A.E.F., Brazzaville, 8, 77–85.
[17]. Malingbar, A., Lang, J., Buoncristiani, J.-F., and Censier, C., 2006, The Mouka-Ouadda Formation, A Cretaceous fluviatile environment in the Eastern part of the Central African Republic: Africa Geoscience Review, v. 13, no. 3–4, p. 301–322
[18]. Global Witness Report July 2015. Blood Timber. HOW EUROPE HELPED FUND WAR IN THE CENTRAL AFRICAN REPUBLIC.
[19]. Bardet, M.G., 1974. Géologie du diamant. Gisements de diamants d'Afrique. Mem. BRGM 83 (2), 223 pp.
[20]. WGDE, 2012. ''Footprint'' or characteristics of the diamond production from the Eastern region around Bria in the Central African Republic. Working Group of Diamond Experts. Available at http://www.kimberleyprocess.com/en/2012- wgde-footprint-car-final (accessed 29.07.13).
[21]. Censier, C., 1996. Alluvial diamond deposits in the Central African Republic. Afr. Geosci. Rev. 3 (2), 217+/–230.
[22]. ICG, 2010. Dangerous Little Stones: Diamonds in the Central African Republic. Africa Report Number 167. International Crisis Group, Brussels.
[23]. Bauters, J., 2012. A Taxonomy of Non-state Armed Actors in the Central African Republic. International Peace Information Service, Antwerp.
[24]. Schlüter Thomas, 2006, Geological atlas of Africa, with notes on stratigraphy, tectonics, economic geology, geohazards and geosites of each country: Berlin, Springer, 272 p.
[25]. Censier, C., Lang, J., 1992. La formation glaciaire de la Mambéré (République centrafricaine): reconstitution paléogéographique et implications a l'échelle du Paléozoïque africain. Géol. Rundsch. 81 (3), 769+/–789.
[26]. Censier, C., Tourenq, J., 1986. Mise en évidence d'une extension occidentale des Grès de Carnot (République Centrafricaine) par analyses sedimentologiques compare´es des gisements alluvionnaires diamantifères. Géodynamique 1 (1), 21–32.
[27]. Petit, M., 1985, A provisional world map of duricrust, *in* Douglas, I., and Spencer, T., eds., Environmental change and tropical geomorphology: London, George Allen & Unwin, p. 269–279.
[28]. Beauvais, A., 1989, Étude pétrographique et géochimique de profils d'altération latéritique cuirassés dans le Sud-est de la République Centrafricaine: Géodynamique v. 4, no. 2, p. 71–91.
[29]. Beauvais, A., and Roquin, C., 1996, Petrological differentiation patterns and geomorphic distribution of ferricretes in Central Africa: Geoderma, v. 73, no. 1–2, p. 63–82.
[30]. Censier, Claude, and Lang, Jaques, 1999, Sedimentary processes in the Carnot Formation (Central African Republic) related to the paleogeographic framework of Central Africa: Sedimentary Geology, v. 127, no. 1–2, p. 47–64.
[31]. Map source: RCA et Processus de Kimberley -Estimation du potentiel diamantifère alluvionnaire et de la capacité de production (2009); DNG-BRGM-USGS.
[32]. Katherine C. Malpeli · Peter G. Chirico 2014. A sub-national scale geospatial analysis of diamond deposit lootability: The case of the Central African Republic.
[33]. Censier, C., 1996. Alluvial diamond deposits in the Central African Republic. Afr. Geosci. Rev. 3 (2), 217–230.
[34]. Dempster, A., and Tutusaus, J.P., 1995, Project d'élaboration d'un plan minier national de la République Centrafrique Rapport Final – Tome 2, Annexe 9 – Brochure promotionnelle sur le secteur minier centrafricain, Secrétaire d'Etat aux Finances, au Plan et á la Coopération Internationale B.P. 696, Bangui: Ireland, Crowe Schaffalitzky Associates.
[35]. Dietrich, Christian, 2003, Diamonds in the Central African Republic, Trading, valuing and laundering, in Smillie, Ian, The Diamonds and Human Security Project: Partnership Africa Canada, Occasional Paper #8, 8 p.
[36]. Ken Matthysen and Iain Clarkson, 2013, Gold and diamonds in the Central African Republic; The country's mining sector, and related social, economic and environmental issues, International Peace Information Service, Antwerp.
[37]. Thomas P. Dolley, 1995. The mineral industry of Central African Republic

[38]. Yadira Soto-Viruet 2010. The mineral Industries of CAR, Ivory Cost, and Togo
[39]. Malik, K., 2013. Human development report 2013: the rise of the South. In: Human Progress in a Diverse World. United Nations Development Programme, New York. Available at http://hdr.undp.org/en/content/human-development-re-port-2013 (accessed 29.07.13).
[40]. Spittaels, S., Hilgert, F., 2009. Mapping conflict motives: Central African Republic. International Peace Information Service, Antwerp.
[41]. ICG, 2013. Central African Republic: Priorities of the Transition. Africa Report Number 03. International Crisis Group, Brussels.
[42]. Jønsson, J.B., Fold, N., 2011. Mining 'from below': taking Africa's artisanal miners seriously. Geogr. Compass 5 (7), 479–493, http://dx.doi.org/10.1111/j.1749-8198.2011.00435.x.
[43]. Bermudez-Lugo, O., 2011. The mineral industries of Central African Republic and Togo In: U.S. Geological Survey Minerals Yearbook—2011. .
[44]. Heemskerk, M., 2001. Collecting data in artisanal and small-scale mining communities: measuring progress towards more sustainable livelihoods. Nat. Resour. Forum 29, 82–87.
[45]. Homer-Dixon, T.F., 1994. Environmental scarcities and violent conflict: Evidence from cases. Int. Secur. 19 (1), 5–40, http://dx.doi.org/10.2307/2539147.
[46]. Turner, M.D., 2004. Political ecology and the moral dimensions of ''resource conflicts'': the case of farmer-herder conflicts in the Sahel. Polit. Geogr. 23 (7), 863–889, http://dx.doi.org/10.1016/j.polgeo.2004.05.009.
[47]. Collier, P., Hoeffler, A., 1998. On the economic causes of civil war. Oxf. Econ. Pap. 50(4), 563–573.
[48]. Collier, P., Hoeffler, A., 2004. Greed and grievance in civil war. Oxf. Econ. Pap. 56 (4), 563–595, http://dx.doi.org/10.1093/oep/gpf064.
[49]. Lujala, P., Gleditsch, N.P., Gilmore, E., 2005. A diamond curse? Civil war and a lootable resource. J. Confl. Resol. 49 (4), 538–562, http://dx.doi.org/10.1177/0022002705277548.
[50]. Auty, R., 2004. Natural resources and civil strife: a two-stage process. Geopolitics 9(1), 29–49, http://dx.doi.org/10.1080/14650040412331307822.
[51]. Le Billon, P., 2008. Diamond wars? Conflict diamonds and geographies of resource wars. Ann. Assoc. Am. Geogr. 98 (2), 345–372, http://dx.doi.org/10.1080/00045600801922422.
[52]. Silberfein, M., 2004. The geopolitics of conflict and diamonds in Sierra Leone. Geopolitics 9 (1), 213–241, http://dx.doi.org/10.1080/14650040412331307892.
[53]. Olsson, Ola, 2006, Diamonds are a rebel's best friend: The World Economy, Blackwell Publishing, v. 29. no. 8, p. 1133–1150.
[54]. Guangzhou 14 November 2014. Final Communiqué from the Kimberley Process Plenary Meeting