

# ARTISANAL AND SMALL-SCALE GOLD AND DIAMOND MINING, WITH RELATIVE IMPACTS ON THE ENVIRONMENT IN THE FORESTED AREAS OF CAMEROON: A CRITICAL ANALYSIS

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## ABSTRACT

This paper is aimed at critically analysing the legal framework on the environmental impacts of artisanal and small-scale gold<sup>i</sup> and diamond mining in The Ngoyla-Mintom Forest Massif (NMF) and the Sangha Tri-National Park (TNS) Landscape<sup>ii</sup> located in Cameroon only. Small-scale mining includes enterprises or individuals that employ workers for mining, but generally still using manually-intensive methods, working with hand tools. However, studies in ASM indicates that the main impacts are: deforestation and land degradation; open pits causing human and animal traps and health hazards (including acting as mosquito breeding grounds due to stagnant water collection after being abandoned by the miners); mercury runoff from gold amalgamation; waste accumulation from inefficient extraction; dust and noise pollution; underground instability and long-term hazards.<sup>iii</sup> Realistically, are the existing laws and regulations governing ASM in Cameroon effectively implemented and complied with? This raises serious concern about the benefits that accrue to them from this age-old activity. Local miners in The Ngoyla-Mintom Forest (NMF) and the Sangha Tri-National Park (TNS) Landscape are generally not aware of the provisions in the mining code of 2016, the forestry law of 1994 and other affected laws. There is no doubt that with appropriate laws and policies, when duly implemented and complied with, ASM can protect our environment and improve the lives of those who are involved in this activity as while as those of the local communities.

**Keywords:** Mining, Forestry, Forested Areas, Open-Pit/Open-Cast Mining, Illegal mining, Alluvial mining.

## INTRODUCTION

In many parts of the world, artisanal or small-scale mining (ASM) activities are at least as important as large-scale mining activities, particularly in terms of the numbers of people employed. The start of artisanal<sup>iv</sup> gold and diamond mining in Cameroon can be traced back nine decades ago essentially concentrated in some localities in the east region of Cameroon. Artisanal gold and diamond mining activities continues in these areas unabated up until today and the advent of industrial mineral exploiters competing for the same resources may be a hindrance to artisanal miners.<sup>v</sup> According to a recent survey carried out by the International Labour Organisation (ILO) and mining, minerals and sustainable development (MMSD), at present around 13 million people work directly in small mines throughout the world, most of them in developing countries. A large percentage of these miners are women and regrettably, children. These grassroots industries have also made important contributions to foreign-exchange earnings, and are now recognized by the government as the cornerstones of a multimillion-dollar industrial sector, the products and sales from which are controlled. Now, the international development community has turned its attention to the ASM sector. In the last 10 years international donor agencies have recognized the close relationship between ASM and poverty. Accordingly, the sector is gaining more attention. ASM is now on the agenda of many national governments, and of bilateral and multilateral donor organizations, and assistance programmes have been or are being carried out. Community artisanal and Small-Scale Mining initiative<sup>vi</sup> (CASM) is an initiative of the World Bank and is a valuable instrument for donor coordination, experience and information exchange and for channeling funds.

Mining in the Ngoyla-Mintom Forest Massifs and The Sangha Tri-National Park Landscape is the best choice for artisanal and small-scale miners since there is no restriction to entry, no tax paid and revenue is immediate compared to other activities. The economic benefits of gold and diamond in the Ngoyla-Mintom Forest Massifs (NMF) and Sangha Tri-National Park Landscape (TNS) are quite considerable, with the consideration of mining business activities both inside mining camps and in surrounding villages.

ASM of gold and diamond are among the most destructive industries in the world. It can displace communities, contaminate drinking water, hurt workers, and destroy pristine environments. It pollutes water and land with mercury and cyanide, endangering the health of

people and ecosystems. Mining has negative impacts on the environment. As observed by the miners in the forested areas of NMFM and TNS, the impacts on the environment listed by the miners are the destruction of fragile forest ecosystems such as forest swamps, diversion, sedimentation and pollution of river courses, and soil destruction. Miners practice poaching and hunt protected species. Illegal logging activities develop in the forest when there are mining activities present. The environmental impact of artisanal and small-scale gold and diamond mining, and the secondary activities it generates in the NMFM and TNS are still on a small scale, but will have adverse effects if mining activities continue to grow at the present rate. Concerns about the impact of mining in the forested areas<sup>vii</sup> of Cameroon and protected areas have focused on: rising levels of mining in sensitive areas; uncontrolled mining that is not organised, often leading to political abuse and manipulation that reduce self-determination of miners; environmental degradation typical of ad hoc development and exploitation; sedimentation and contamination of water catchment; negligent use of Hg compounds and lack of reclamation. Affected communities have been ignored, and mistrust towards outside parties is high.<sup>viii</sup>

The government attaches some importance to this activity and in 2003 created the Framework Support Unit for Artisanal Mining promotion commonly called CAPAM in its French acronym, and today SONAMINE.

## **THE CONCEPT OF ILLEGAL MINING/ARTISANAL AND SMALL-SCALE MINING**

Illegal mining is mining activity that is undertaken without state permission, in particular in absence of land rights, mining licenses, and exploration or mineral transportation permits.<sup>ix</sup> Illegal mining can be a subsistence activity, as is the case with artisanal mining, or it can belong to large-scale organised crime, spearheaded by illegal mining syndicates. On an international level, approximately 80% of small-scale mining operations can be categorised as illegal.<sup>x</sup> Despite strategic developments towards “responsible mining,” even big companies can be involved in illegal mineral digging and extraction, if only on the financing side.<sup>xi</sup> However, this paper is focused on artisanal mining.

## PHYSICAL CHARACTERISTICS OF FORESTED AREAS IN CAMEROON: THE CASE OF NGOYLA-MINTOM (NMFM) FOREST AND THE SANGHA TRI-NATIONAL PARK (TNS) LANDSCAPE

In this section our discussion will be based on the geomorphology of the Ngoyla-Mintom Forest and the Sangha Tri-National Park Landscape.

### **i. Geomorphology of the Ngoyla-Mintom Forest**

The Ngoyla-Mintom forest massif is located in the south and east regions of Cameroon. The massif is made up of nine forest management units (FMUs). It gets its name from the two subdivisions it covers, which are the Mintom subdivision in the South Region and Ngoyla in the East Region of Cameroon. The Ngoyla-Mintom forest massif is situated between latitude 2°10'N and 3°00'N and longitudes 13°20' E and 14°35' E. The massif is limited to the north and the west by the Dja Biosphere Reserve, to the south by the Gabonese and Congolese borders, and to the east by Nki National Park. There is no agreement on the area of the Ngoyla-Mintom forest massif. World Bank figures range between 932, 142 ha<sup>xii</sup> and 988,000 ha. The area is located between Dja Forest Reserve, Nki National Park (Cameroon) and Minkebe national parks in Cameroon, Congo, and Gabon, respectively) zone.<sup>xiii</sup>

The soils encountered in this massif developed from different parent rocks. These different substrata have given birth to different landforms. The mountainous terrains to the south of the Nyong, which extend from the region of Ngomedzap south of Ebolowa, is a zone of orthogenesis and granites of pyroxenes. The mineralogy of these soils includes quartz, kaolinite, goethite and gibbsite. The drainage network is dendritic and dense and the terrain is marked by the presence of hills with strong topographic elevations.<sup>xiv</sup>

Concerning the plant and animal species, the Ngoyla-Mintom forest ecosystem is located in the Congolese 'Dja district'.<sup>xv</sup> It is characterized by an absence of semi-deciduous forest species and Atlantic forest (including *Ceasalpinaceae*, with the exception of the gregarious *Ceasalpinaceae* such as *Gilbertiodendron dewevrei*), the presence of several species and some endemic genera known only in the Dja district, the swamp forests of Haut- Nyong, *Sterculia subviolacea* in the Congo Basin and important stands of *Uapacapuludosa*. The vegetation consists of the following major groups: evergreen rain forests (82% of the total), complex of swamp forest (15%), a mosaic of secondary forests, plantations and agricultural areas inhabited

(1%), and forest clearings (2%).<sup>xvi</sup> It has a population national density of 36.86 inhabitants/km<sup>2</sup>. This density varies from one region to another.

The NMFM is one of the least populated areas of Cameroon. The Ngoyla subdivision, which covers approximately 4382 km<sup>2</sup>, has a population density of approximately 1 inhabitant/km<sup>2</sup> and a total population of nearly 5000 people. The Mintom subdivision has approximately 7500 people.<sup>xvii</sup>

## **ii. *Geomorphology of The Sangha Tri-National Park (TNS) Landscape***

The Sangha Tri-National Park (TNS)<sup>xviii</sup> Landscape is a forest divided between the nations of Central African Republic, Cameroon and Congo-Brazzaville. Natural values and features include the ongoing ecological and evolutionary processes in a mostly intact forest landscape at a very large scale. Numerous and diverse habitats such as tropical forests comprised of deciduous and evergreen species, a great diversity of wetland types, including swamp forests and periodically flooded forests and many types of forest clearings of major conservation importance continue to be connected at a landscape level. This mosaic of ecosystems harbours viable populations of complete faunal and floral assemblages, including top predators and rare and endangered species, such as forest elephants, gorillas, chimpanzees, and several antelope species, such as the sitatunga and the emblematic Bongo. Nile crocodiles and goliath tiger fish are also found there.

The site's environment has preserved the continuation of ecological and evolutionary processes on a huge scale and great biodiversity, including many endangered animal species.<sup>xix</sup>

The Cameroonian section is centered on Lobéké National Park.

The forests of the Landscape have been recognised as critical for conservation in Africa and as one of the priority areas for forest conservation in the northwest Congolese eco region. There are major opportunities for conservation thanks to protected areas covering 21.5% of the whole landscape (752 000 ha) and cross-border cooperation agreements signed in 2000 by the three countries. The governments and international organisations such as WWF, IUCN and UNESCO actively engage in the conservation of the protected areas and move towards sustainable management of the buffer zones in two of the three countries.<sup>xx</sup>

The Sangha Tri-National Park Landscape (TNS) consists entirely of plateaus broken by alluvial plains. Altitude varies between 330 and 600 m in the Republic of Congo and reaches nearly 700 m in Central African Republic (CAR).

The vast majority (93%) of the Landscape is composed of highly biodiverse dense rainforest, with some semi-deciduous terra firma forests rich in tree species. Trees with commercial value include *Terminalia superba* (Limba), Sterculiaceae, in particular *Triplochytton scleroxylon* (Ayous), and Ulmaceae. Its forests show a monodominance of *Gilbertiodendron dewevrei* and Marantaceae.<sup>xxi</sup> An estimated 5.6% of the Landscape is inundated, containing mixed swamp forests with riparian forests of *Uapaca heudelotii* and raffia palm groves. Among the trees, several species appear on the IUCN Red List: *Austroriparia congolensis*, *Pericopsis elata* (afroformosa), *Diospyros crassiflora* (ebony) and *Swartzia fistuloides* (paorosa or African tulip wood).<sup>xxii</sup> In addition, all the species of the genera *Entandrophragma* and *Khayathat* have been logged are considered vulnerable, as are other commercial species: *Aningeria altissima* (anigre), *Mansonia altissima*, *Pausinystalia macroveras* (tsanya) and *Gambeya pulchra* (longhi).<sup>xxiii</sup> The PNNN is a sanctuary for all these species, but it depends upon sustainable management of the surrounding concessions in order not to lose these important resources.

The Landscape has an exceptionally rich biodiversity of fauna. In the CAR sector, 105 species of land mammals have been identified, including: the African forest elephant *Loxodonta africana cyclotis*; 16 species of primates, among them the gorilla *Gorilla gorilla*, the chimpanzee *Pan troglodytes* and at least 6 small nocturnal species; 14 species of ungulates, including the bongo antelope *Tragelaphus euryceros* (a species that is declining rapidly in Central Africa and is very rare in East Africa); and 14 species of carnivores, including the leopard *Panthera pardus*. The hippopotamus *Hippopotamus amphibius* still has a significant population along the Sangha River.<sup>xxiv</sup>

There is a significant population of the Dja River warbler *Bradypterus grandis*, a species endemic to the marshes of *Rhynchospora* of Lower-Guinea, exists in Lobéké National Park; this species is also known in the marshes of PNNN. An as yet undescribed species of night jar *Caprimulgus* sp. has been found in Lobéké National Park and PNNN. A new species of *Turdidae*, *Stiphornis sanghae*, was described in 1999 in Dzanga-Sangha Special Reserve and has not yet been found elsewhere.<sup>xxv</sup>

The reptiles found in this Landscape are typical of the region, including: the Nile crocodile *Crocodylus niloticus*, the slender-snouted crocodile *Crocodylus cataphractus*, the dwarf crocodile *Osteolaemus tetraspis* (an endangered species), the Nile monitor lizard *Varanus ornatus*, the softshell turtle *Trionyx triunguis*, the African rock python *Python sebae*, the royal

python *Python regius*, the coiled Gabon viper *Bitis gabonica* and the green mamba *Dendroaspis jamesoni*.<sup>xxvi</sup>

Fish species are little known, despite their importance for the local population. In the Cameroonian portion of the Sangha Basin, more than 200 species of fish have been identified, and the whole basin has nearly 300 identified species. The Sangha is a very dynamic environment because of silting and seasonal fluctuations that influence the reproduction, feeding regime and distribution of the fish. Among the most remarkable families in the areas of the flooded or floodplain forests are the Alestiidae with *Hydrocynus goliath*, the Aplocheilidae, the Cichlidae with the genus *Tilapia*, the Claroteidae with the genus *Auchenoglanis*, the Cyprinidae with the genera *Labeo* and *Barbus*, the Mochokidae with the genus *Synodontis*, the Malapteruridae with the electric catfish *Malapterurus* sp. and the Schilbeidae.<sup>xxvii</sup>

## **IMPORTANCE OF THE NGOYLA-MINTOM FOREST MASSIF FOR CONSERVATION AND THE SANGHA TRI-NATIONAL PARK (NTS) LANDSCAPE**

Here we will explore some salient important issues pertaining to the Ngoyla-Mintom Forest Massif and the Sangha Tri-National Park (NTS) Landscape.

### ***i. Importance of The Ngoyla-Mintom Forest Massif For Conservation***

From the outcome results of surveys conducted in the Dja Reserve and in this forest, as well as wildlife inventories conducted in Minkebe National Park<sup>xxviii</sup> and Nki National Park<sup>xxix</sup> have confirmed the existence of elephant migration corridors between the Ngoyla- Mintom massif, Dja Reserve (southeast), Nki National Park (southwest) and the forest of Souanké-Sembé (Congo). The distribution of elephant populations suggests the existence of another migration corridor between the Ngoyla-Mintom massif and forest management units 09-005a and 09-003 (between the villages of Lélé and Mintom), but which is now broken because of the settling of the population along the highway Mintom-Lélé. The existence of these connections demonstrates the importance of the forests of Ngoyla-Mintom in the genetic flow between animal populations in the protected areas of Dja, Boumba-Bek, Nki and Minkébé (Gabon).<sup>xxx</sup>

Cameroon has 22.5 million ha of forest and the Ngoyla-Mintom forest massif occupies a strategic position as it covers a total surface area of 988,000 ha and lies between the eastern and southern regions, which are the two regions that carry the largest surface area of forest in the country. Located within the TRIDOM landscape, it is a conservation zone of world importance, and the object of a concerted accord signed in 2005 in Brazzaville between Cameroon, Congo and Gabon.<sup>xxxii</sup> This area has been kept aside for conservation and sustainable management of natural resources since the colonial period; the forest is made up of nine forest management units (FMUs). The Ngoyla-Mintom forest is at the center of a number of developmental projects in the country today, notably mining projects of cobalt, nickel and manganese in Nkamou, the construction of a dam over the Mekin River and several other projects.<sup>xxxiii</sup>

The Government of Cameroon, through the Ministry of Forestry and Wildlife (MINFOF), has engaged with the assistance of the World Bank, the preparatory phase of the Conservation and Sustainable Management of the Ngoyla-Mintom Forest Project. The World Bank under project number P118018 approved the project in April 2012.<sup>xxxiii</sup>

#### ***ii. The Importance of The Sangha Tri-National Park (TNS) Landscape***

The TNS landscape contains vast extent of different types of pristine forests with high ecological integrity, a rare phenomenon in the Congo Basin and worldwide. It provides habitats for some of the largest intact communities of large mammals in Africa, being particularly important for forest elephants and great apes.<sup>xxxiv</sup> The “bias” (open grassy areas, often with water) are environments much sought after by many mammals and birds, forming an essential assets.

The forests of the Landscape have been recognized as critical for conservation in Africa and as one of the priority area for forest conservation in the northwest Congolese ecoregion. There are major opportunities for conservation thanks to protected areas covering 12.5% of the whole landscape (752000 ha) and cross-border cooperation agreements signed in 2000 by the three countries. The governments and international organizations such as WWF, IUCN and UNESCO actively engage in the conservation of the protected areas and moved towards sustainable management of the buffer zones in two of the three countries.<sup>xxxv</sup>

### ***Mining Techniques and Procedures***

The techniques used for mining around the world are almost identical. Each community of miners adapt the existing techniques to suit their context and prospected site. The depth of the hole depends on the depth of the gold bearing gravel. The average depth of holes in the NMFMM is 2m deep.<sup>xxxvi</sup>

Since mining is practiced in swamps and lowland areas, holes are constantly being filled by water as miners dig. Motorized pumps are used to bail out this water. During the rainy season water is always a major problem for miners. In certain places motorized pumps are left to run all night and day, even when miners are not working to avoid flooding of the holes. Once the gravel is reached, a portion of land is cleared and the gravel removed is deposited in heaps. The washing process starts immediately.<sup>xxxvii</sup>

Nowadays, changes have occurred in the materials/equipment used and in the techniques of giggering and washing of gold and diamond.

## **SOME STAKEHOLDERS AND INSTITUTIONS INVOLVE IN ASM IN CAMEROON**

This section details with the key institutions involved in ASM in Cameroon, such as the ministry of mines, industries and technological development (MINMIDT) and SONAMINES.

### ***i. The Ministry of Mines, Industries and Technological Development (MINMIDT)***

The Ministry of Industry, Mines and Technological Development (MINMIDT) is responsible for the issuance of mineral exploration licence.<sup>xxxviii</sup> Its aim is to put at the disposal of actors of the sub-sector on the one hand, and of the general public, on the other hand, statistical data which illustrate the actions and development policies implemented in this ministerial department. The Institute for Geological Research (IRGM) under the MINMIDT is the agency responsible for all geologic and mining activities (including conducting geologic exploration programs, mechanized drilling operations, overseeing the mining of mineral deposits and preventing unauthorized exploitation of mines and quarries) in the country.<sup>xxxix</sup>

### ***ii. The National Mining Corporation (SONAMINES)***

The Cameroon National Mining Corporation (SONAMINES) also known in French as “Société Nationale Des Mines” was created on the 14<sup>th</sup> December, 2020 through a Presidential

Decree<sup>xi</sup> signed by the Head of State. It replaces CAPAM. SONAMINES shall be a public corporation, with the state as sole shareholder.<sup>xii</sup> This corporation shall have legal personality and financial autonomy.<sup>xiii</sup> This corporation shall develop and promote the mining sector in Cameroon, with the exception of hydrocarbons and quarry materials, and manage the interests of the State in the domain.<sup>xiiii</sup> The Decree succinctly states among others that SONAMINES shall be responsible to ensure the implementation of measures relating to the restoration, rehabilitation and closure of mining sites, in conjunction with other relevant government services<sup>xliv</sup>

## LEGAL FRAMEWORK

Our concern here is on the Mining code, the 1994 Cameroon forestry Law and the 1996 Environmental and management Law. However, other affected legislations will be examined where and when necessary. We will commence with the Cameroon mining code, 2016.

### *i. Mining Code, 2016 and Policy in Cameroon*

Cameroon's mining industry is regulated by the Law N° 2016/017 of 14 December, 2016 on the Mining Code, which originally aimed to improve the country's attractiveness to foreign operators and was a shift away from too – intrusive legislation with a socialist flavor. The code reserves artisanal mining to Cameroonians and provides that the attribution of an operating permit “may give rise to the attribution to the State of a share at the greatest equal to 10% of shares in the operating company, “in which case the shareholding and price are to be determined before operation begin.

The Mining Code of 2016 adopted<sup>xlv</sup> and its Application Decree N° 2002/046 PM of 26 March 2002 regulate the mining sector in Cameroon.<sup>xlvi</sup> The new law is more detailed than the old one. It is made up of 242 sections. We notice significant advancement in several domains, such as protection of the environment, the recognition of the status of artisanal miners and the encouragement of foreign investment. Cameroonian laws oblige anyone exploiting a mining site to close and restore it before departing.<sup>xlvii</sup> In practice, however, once miners finish digging up gold from pits of up to 100 metres deep, they simply move on to the next project. Few – if any – mining holes are properly restored.

The code records that small-scale mining permits shall be issued by the minister in charge of mines.<sup>xlviii</sup> A small-scale mining shall confer on its holder the right to extract mineral substances from the soil or sub-soil, by any standard process or method to obtain the useful substances therefrom.<sup>xlix</sup>

The Code stipulates that “prospecting, exploration or mining may not be undertaken without authorisation from the competent authorities in any area within the meaning of the forestry, and environmental laws and under international agreements.<sup>l</sup>The code provides that“...any mining and quarry operation undertaken must comply with the laws and regulations in force relating to sustainable environmental protection and management”.<sup>li</sup> This is the onus of the problem of Artisanal miners in the Ngoyla-Mintom Forest Massif for conservation and the Sangha Tri-National Park (NTS) Landscape (TNS) in Cameroon.

### ***ii. The 1994 Forestry Law and Policy in Cameroon***

Cameroonian forests have a long history of regulatory and institutional settings. During the colonial period, Germany, the UK and France had administrative units in place to regulate the forestry sector, and after independence, new forest laws were adopted by the Republic of Cameroon in 1974 and 1981.<sup>lii</sup> In 1994, Forest Law<sup>liii</sup> was voted and then implemented through Decree N° 95-53-PM of 23 August 1995.<sup>liv</sup> With the adoption of a new forest law, a comprehensive national forest policy framework was laid down, directly linking the concepts of sustainable forest management with the preparation of FMPs for all productive forests. The 1994 law had four main objectives, notably:

- better protection of the national forest patrimony;
- protection of the environment and biodiversity;
- amelioration of the living conditions of the people through the integration of forestry in rural development;
- increasing the contribution of the forestry sector to the country’s GDP.

One of the most important aspects of Cameroon’s 1994 law on the forest regime is the division of its forestlands into two domains: the permanent forest estate (PFE) and non-permanent forest estate (NPFE).<sup>lv</sup> The law stipulates that PFE lands should occupy at least 30% of the national territory, be representative of the national biodiversity, permanently serve as forest and/or habitat for wildlife and be sustainably managed according to approved management plans.<sup>lvi</sup> Permanent Forest shall comprise lands that are used solely for forestry and or a wildlife habitat.<sup>lvii</sup> The overarching principle is that all forestlands in Cameroon are under some form

of State control. The PFE includes production and protection forests, which can be in the public or private domain, as well as council forests, which may also be designated for production or protection and which are in the private domain of a council. Forests in the NPFE are in the national domain; they are recognized as part of a collective patrimony managed by the State, but they may be privately owned under certain circumstances. This category is zoned as agroforestry and includes community crops, community forests and in some cases, private forests.<sup>lviii</sup>

It is important to note that the Cameroon Forestry Law and The Implementing Instruments thereof lay down forestry, wildlife and fisheries regulations with a view to attaining the general objectives of the forestry, wildlife and fisheries policies within the framework of an integrated management of the various ecosystems.<sup>lix</sup>

### ***iii. Environmental Law In Cameroon, 1996***

This law lays down the general legal framework for environmental management in Cameroon. The environment constitutes a national common heritage in the Republic of Cameroon, it is an integral part of the universal heritage. According to the 1996 Cameroon environmental law its protection and the rational management of the resources it provides to human life are of general interest. These resources concern mostly the geosphere, the hydrosphere, the atmosphere, their material and immaterial content, as well as the social and cultural aspects they comprise.<sup>lx</sup>

### ***Any Link Between Mining And The Forest?***

For sure, mining activities carried out within forest milieus are governed by two different legal frameworks, notably the mining code of 2016 governing the mining sector<sup>lxi</sup> and the Law regulating forests, wildlife and fisheries.<sup>lxii</sup> No in-depth study has been conducted on the agreement between forestry laws and laws on sectors such as land tenure, mining, water resources and energy, agriculture and infrastructure. There are conflicts of interest and overlapping rights and obligations, which reflect the urgent need for such research and appropriate decision-making. An example of the lack of compatibility between the forestry and mining laws is that mining permits have been issued for sections of national protected areas (Lobéke<sup>lxiii</sup> and Boumba Bek National Parks,<sup>lxiv</sup> part of the Sangha Tri-National Park, which is soon to be designated a world heritage site, and the Douala Edea Wildlife Reserve) and for forest concessions such as the registered concession in the east.<sup>lxv</sup>

## **ENVIRONMENTAL IMPACTS OF ARTISANAL GOLD AND DIAMOND MINING IN THE FORESTED AREAS OF CAMEROON: AN EYES BERG**

Mining operations usually create a negative environmental impact, both during the mining activity and after the mine has closed. Hence, most of the world's nations have passed regulations to decrease the impact, however, the outsized role of mining in generating business for often rural, remote or economically depressed communities means that governments sometimes fail to fully enforce regulations. In this section, we will examine the environmental impacts of artisanal gold and diamond mining in the forested areas of Cameroon and assessed the role of laws governing this area. We will begin with the impacts on the forest.

### **1. *Impacts on the Forest***

Miners cut down the forest in and around mining camps to have larger mining surface areas, and for the purpose of safety. Miners used to felled these trees with axes but today they use chainsaws. With the use of chainsaws, miners fell a bigger number of trees thereby reducing surfaces covered by forest.

In reality mining is one of the main causes of deforestation. The environmental impact of mining includes soil erosion; formation of sinkholes, loss of biodiversity, and contamination of soil; groundwater and surface water by chemicals from mining process. Mining occur so as to extract precious metals such as manganese, gold, diamond etc., which are found in many tropical rainforest. These metals such as gold are used to make jewelry. Mining is a destructive activity that damages the rainforest ecosystem and causes problems for people living nearby and downstream. Forests are cleared to establish the mines and construct roads to transport the materials. While deforestation and chemical pollution from mining can impact the rainforest environment; it can affect the aquatic habitats even more. Nowadays, natural resources are becoming scarce, and rainforests have many quantities of raw materials such as plants, timber, gold and iron, all of which are currently being exploited illegally.

What is the position of the Law? The mining code provides that protected zones may be established by the minister in charge of mines in conjunction with the relevant government services, within which prospecting, exploration and mining of mineral or quarry substances are prohibited.<sup>lxvi</sup> The code further states that closed zones shall aim to protect ... tourist sites, water points, ... archaeological sites, agricultural concerns, protected areas within the meaning

of forestry and environmental laws, and all areas deemed necessary for the preservation of the environment and general interest.<sup>lxvii</sup> The mining code again stipulates that “... any mining and quarry operation undertaken must comply with the laws and regulations in force relating to sustainable environmental protection and management”<sup>lxviii</sup>

Concerning the forestry law, it records clearly that the initiation of any development project that is likely to perturb a forest or aquatic environment shall be subject to a prior study of the environmental hazards.<sup>lxix</sup> It further stipulates that “the State shall ensure the protection of the forestry, wildlife and fishery heritage,<sup>lxx</sup> and the genetic resources of the national heritage shall belong to the state of Cameroon. No person may use them for scientific, commercial or cultural purposes without prior authorisation”.<sup>lxxi</sup> Therefore, clearing or exploitation shall be forbidden in forest or parts of forests that have been declared out of bounds or classified as state forests as provided for in the preceding subsection.<sup>lxxii</sup> So far, “any natural person or corporate body found guilty of violating the provisions of this law and its implementation instruments shall be liable and punishable in accordance with the penalties provided therefor”.<sup>lxxiii</sup> For instance, the sanction for clearing or setting fire on a State forest, an afforested or a fragil ecological zone, in contravention of this provision shall pay a fine of from 200,000 to 1,000,000 CFA francs or imprisonment for from 1 to 6 months or both such fine and imprisonment shall be imposed on whoever commits this offence”.<sup>lxxiv</sup> Hence, within the context of this study the NMFM and TNS forested areas of Cameroon are protected zones as per the law. Quarry: Can we believe that ASM miners of the NMFM and TNS areas are respecting the above mentioned provisions of the laws? Do miners of the NMFM and TNS forested areas even understand that these zones are state protected zones and that forest resources are assigned in accordance with the master plan for regional development? Far from that. The response is that artisanal miners are ignorant and have little or no knowledge about the existing mining code and the forestry laws.

## **2. Open-Pit/ Open-Cast Mining**

Open-pit or open-cast mining, also known as open-cast or open-cut mining is a surface mining technique that extracts minerals from an open pit in the ground.<sup>lxxv</sup> One of the main effects of artisanal mining on the environment in the NMFM and The TNS forested Landscape is soil degradation and land damage. Miners do not refill the holes they make after mining. Pits lengths, widths and depths are 4, 3 and 2 m on average, respectively.<sup>lxxvi</sup> Abandoned after mining, these open mines become traps for animals and breeding grounds for mosquitoes. No

plants can grow around the area. After the mining operations are complete, what happens to an open-pit mine? The code succinctly states that: “each operator shall be responsible for the restoration, rehabilitation and closure of mining and quarry sites”.<sup>lxxvii</sup> The code further emphasizes that the former mining and quarry sites must be restored to stable conditions of security, agro-sylvo-pastoral productivity and appearance close to their original state or conducive to any new sustainable development deemed suitable and acceptable by the authorities in charge of mines, the environment and any other relevant authority.<sup>lxxviii</sup> Therefore Cameroon mining code obliges anyone exploiting a mining site to close and restore it before departing and artisanal mining is no exception. According to the 1996 law,<sup>lxxix</sup> “holders of mining permits or quarrying permits shall rehabilitate the exploited sites”.<sup>lxxx</sup> Also, the decree of 14 December, 2020 states that “ensuring the implementation of measures relating to the restoration, rehabilitation and closure of mining sites, in conjunction with other relevant government services;”<sup>lxxxi</sup> The Environmental Management law of 1996<sup>lxxxii</sup> states that holders of mining permits or quarrying permits shall rehabilitate the exploited sites.<sup>lxxxiii</sup> “... holders of mining permits and quarrying permits may choose to pay the financial cost of rehabilitation carried out by the competent administration.”<sup>lxxxiv</sup> Quarrel: Are these laws relating to restoration, rehabilitation and closure of mining and quarry sites respected by artisanal miners in the NMFM and (TNS) Landscape? The provisions of these laws mentioned above are not complied with at all in the NMFM and TNS. In practice, however, once miners finish digging up gold and diamonds from pits of up 100 metres deep, they simply move on to the next project.

### **3. Destruction of Forest Swamps and Diversion**

Observed impacts included diversion and sedimentation of some rivers. All mining camps surveyed practiced alluvial mining. Miners carry out mining in forest swamp areas, diverted river courses and mines in the diverted riverbeds. Forest swamps have high biological diversity and constitute complex ecosystems. They play several roles in maintaining the equilibrium of forest ecosystems in terms of: groundwater recharge and discharge, flood control, sediment and toxicant retention, nutrient retention, biomass export, wildlife resources, fisheries resources and water supply.<sup>lxxxv</sup> The disruption of this equilibrium will have huge environmental consequences, notably the destruction of the habitat of some animals such as the water chevrotain (*Hyemoschus aquaticus*) that lives in these forest swamps and has a declining population. Mining in general produces huge quantities of mud and sand. This mud

is transported downstream and leads to the sedimentation of rivers, and causes forest marsh floods, which is harmful to fish.<sup>lxxxvi</sup> The law is clear in that flood plains shall be specially protected. This protection shall take into consideration their role and importance in biodiversity conservation.<sup>lxxxvii</sup> Can violation of the above provisions be considered as offences per Cameroonian law? Of course, yes. Its an offence because flood plains are specially protected by law. The Penal code clearly registers that: “whoever without lawful permission obstructs the use of any public highway or waterway, or renders passage less convenient, whether by damaging the surface of the highway or diverting the course of the waterway, or by erection, or by excess use, or by use of his own adjacent land, shall be punished with imprisonment for from one month to two years”.<sup>lxxxviii</sup> Furthermore, the destruction of the environment within a distance of 50 metres along a water course or over a radius of 100 metres around its source shall be forbidden.<sup>lxxxix</sup>

#### **4. Pollution of Rivers**

Oil waste and fuel from motorized pumps is disposed of in watercourses and this adversely affects the environment for animal, plant life and quality of water. It is likely to affect human life as most streams and rivers where surrounding village populations collect water pass through these forest swamps. Local populations have reported health issues related to mercury poisoning such as tremors and memory loss.<sup>xc</sup> A continuous increase in the number of mining camps and the number of miners will eventually increase the environmental risks.<sup>xc1</sup>

Absolute dependence on large amounts of water for mining operations indicates that ASM be therefore part of a river system. Alluvial mining is mining done in a stream or riverbed. Alluvial mineral deposits are essentially primary lode deposits broken down by weathering and erosion upstream, transported by gravity and water movement over many millennia of geological time, and deposited. All mining camps surveyed practiced alluvial mining in the NMF. The use of water for mineral concentration results in accelerated evaporation of surface water, drainage of wetlands and siltation of rivers in Cameroon. People living there may start to develop skin rashes, headaches, vomiting, diarrhea and other medical conditions. Contaminated discharges are almost entirely caused by inadequate management of the waste products derived from mining and processing activities, indicating a failure of policy and public supervision to control the mining activities, as well as a general difficulty in achieving good environmental performance among small-scale miners.

What is the response of the law? First and foremost, the Cameroon constitution in its preamble states that: “every person shall have a right to a healthy environment. The protection of the environment shall be the duty of every citizen. The state shall ensure the protection and improvement of the environment”.<sup>xcii</sup> This constitutional provision lays emphasis on the importance of the environment to Cameroonians and that the state shall do all in its powers to protect the environment against defaulters. As per Cameroonian laws, the code states that: “in order to ensure the rational use of mineral and quarry resources in line with environmental protection, holders of mining and quarry titles shall be responsible for: preventing or minimising the discharge of waste in the open,<sup>xciii</sup> promoting or maintaining the general health of the population<sup>xciv</sup> and reducing waste”.<sup>xcv</sup> Again, in line with environmental protection, holders of mining titles shall be responsible for disposing of non-recycled waste in such manner as to ensure safety of the environment after informing and receiving the approval of the authorities in charge of mining and the environment.<sup>xcvi</sup> As for the forestry law of 1994 is concerned, this law forbids any one from dumping, in natural forests as well as in public waterways, in lakes and in the sea, any toxic product or industrial waste likely to destroy or modify animal and plant life.<sup>xcvii</sup> The law also states that “industrial, handicraft and other units producing toxic materials or waste shall be bound to treat their effluence before dumping it in the natural environment.<sup>xcviii</sup> Also, the pouring or discharging into the aquatic environment of toxic or noxious materials such as industrial, agricultural or domestic waste and pollutants (pesticides, fertilizers, sediments, detergents) are forbidden.<sup>xcix</sup> The Cameroon environmental management law<sup>c</sup> stipulates that: “...direct or indirect spill incidents, discharges, dumpings of any kind, and more generally, any act likely to provoke surface or underground water degradation through the modification of their physical, chemical, biological or bacteriological characteristics shall be prohibited”.<sup>ci</sup> The penal code states that: “Whosoever by his operations (a) pollutes the any drinkable water liable to be used by another; or so pollutes the atmosphere as to render it harmful to human health – shall be punished with imprisonment for from fifteen days to six months, or with fine of from five thousand to one million francs, or with both such imprisonment and fine”.<sup>cii</sup>

Quarrel: Are artisanal miners of the NMFM and the NTS aware of these plethora pollution prohibitions provided by the laws? Not actually. Artisanal miners in the NMFM and the NTS areas do not comply to these laws. This response is partially based on the argument advanced by the (then) Divisional Delegate of Mines for the Boumba and Ngoko Division who affirmed

his high level of experience in the mining sector that he believes that small-scale miners do not want to follow the rules and regulations governing the sector, because this could cost them 5000 CFA per year.<sup>ciii</sup>

### **5. Impacts on Wildlife**

Wildlife traditionally refers to undomesticated mineral species, but has come to include all organisms that grow or live wild in an area without being introduced by humans. Wildlife was also synonymous to game: those birds and mammals that were hunted for sports. Wildlife can be found in all ecosystems, deserts, forests rainforest, plains, grasslands and other areas, all have distinct form of wildlife. Hunting is the oldest activity practiced in Cameroon, notably the Baka<sup>civ</sup> people. Mining activities have led to an intensification of hunting for personal consumption, others sell their catch but nobody depended exclusively on income from hunting. All bush meat consumed in mining camps comes from the surrounding forest and other mining camps.

How does the law regulates wildlife sector under Cameroonian laws? The mining code stipulates that in order to ensure the rational use of mineral and quarry resources in line with environmental protection, holders of mining and quarry titles shall be responsible for the protection of fauna and flora.<sup>cv</sup>

This section is sending a serious warning to artisanal miners in the forested areas in Cameroon. In fact these illegal miners ignore this provision of the code completely. Practically, hunting is done through trapping and a few miners use guns.<sup>cvi</sup> Noted that hunting with unconventional devices; hunting with fixed guns and dane guns are forbidden except where specially authorised by the service in charge of wildlife. The code succinctly stipulates that: “any hunting method, whether traditional, which endangers the conservation of certain animals may be forbidden or regulated by the service in charge of wildlife.<sup>cvii</sup> The forestry law states that: “Even though traditional hunting is authorised throughout the national territory, but with exception in State forests protected for wildlife conservation”.<sup>cviii</sup> According to the environmental management law, the protection of nature, the preservation of animal and plant species and their habitat, the maintenance of biological balances and ecosystems and the conservation of biodiversity and genetic diversity against all causes of degradation and threat of extinction are of national interest, it shall devolve on the administration and each citizen to safeguard the natural heritage.<sup>cix</sup> This law further states that: “biodiversity conservation through the protection of the fauna and flora, the creation and management of natural reserves

and national parks shall be govern by the laws and regulations in force”.<sup>cx</sup> Are miners of the NMFM and the TNS forested areas aware that hunting in State forest is forbidden by law and needs to be protected for wildlife conservation? The response is, yes. The miners are aware. According to the Cameroon Penal Code, neither ignorance of the law nor motive shall be material to criminal responsibility.<sup>cxii</sup> In other words, ignorance of the law is not an excuse. This implies that the NMFM and the TNS forested areas are protected State forest and is out of bounds to wildlife hunters. So, wildlife hunting in these protected areas is prohibited by law. Going by the readings of section 24 (1) (a) and (b) following of the forestry law<sup>cxii</sup> “any natural person or corporate body found guilty of violating the provisions of this law and its implementation instruments shall be liable and punishable in accordance with the penalties provided thereof<sup>cxiii</sup> and the same penalties as in the case of the offender shall be inflicted on accomplices or any other persons, who in one way or the other, contributed to the offence.”<sup>cxiv</sup> This is clear indication that the law protects the NMFM and the TNS forested areas and the resources therein.

Again poaching activities in the NMFM especially, show that hunters are covering longer distances into the forest from their village – up to 30 km in places.<sup>cxv</sup> The creation of mining camps inside the forest provides poachers with contact points. These poachers hunt protected species because of their high economic value. Miners reported cases of poachers who live inside mining camps but carry out hunting in Obac and Mvan mining camps. Several cases of hunters intercepted with protected animal parts from mining camps notably the gorilla,<sup>cxvi</sup> ivory (elephant) and giant pangolin scales have been reported. The proliferation of mining camps reduces animal habitat. The presence of human activities inside the forest has an impact on animal behavior. Miners reported cases of chimpanzees that came to feed on waste around mining camps at night. The law states that animal species living in the national territory shall, for the purpose of their protection, be classified into three classes: A, B and C, according to conditions laid down by order of the minister in charge of wildlife.<sup>cxvii</sup> This law further states that the species of class A shall be totally protected and may on no occasion be killed except as provided for in sections 82 and 83 of this law.<sup>cxviii</sup> The mining code of 2016, has actually taken care of this situation as it stipulates that: “in order to ensure the rational use of mineral and quarry resources in line with environmental protection, holders of mining and quarry titles shall be responsible for protecting fauna and flora”.<sup>cxix</sup> This simply means that miners in the forested areas of the Ngoyla-Mintom massif forest (NMF) and the Sangha Tri-National Park

(TNS) Landscape are seriously violating the law by their killing of protected species and these protected classes of animals indiscriminately as they come across them.<sup>cxx</sup> At times this act is carried out with the clear knowledge of government officials who are purported to have prohibited and deterred this act in lieu of conniving with them. The law further states: “any natural person or corporate body found guilty violating the provisions of this law and its implementation instruments shall be liable and punishable in accordance with the penalties thereof”.<sup>cxxi</sup> The same penalties as in the case of the offender shall be inflicted on accomplices or any other persons who, in one way or the other, contributed to the offence.<sup>cxxii</sup>

The point here is that hunting in The Ngoyla-Mintom Forest (NMF) and the Sangha Tri-National Park (TNS) Landscape is increasing reason being that compliance and enforcement mechanisms or instruments are either lacking or not existing at all.

The law<sup>cxxiii</sup> again provides that “subject to the provisions of section 81 of this law, traditional hunting is authorized, throughout the national territory except in State forests protected for wildlife conservation or in the property of third parties”.<sup>cxxiv</sup> However, their capture or their being kept in captivity shall be subject to the grant of an authorization by the service in charge of wildlife.<sup>cxxv</sup> The emphasis here is “...except in State forests protected for wildlife conservation or in the property of third parties”. The issue is whether artisanal and small-scale miners in The Ngoyla-Mintom Forest (NMF) and the Sangha Tri-National Park (TNS) are aware of the existence of the above provisions of the laws? The response here is in the affirmative.

### **6. Impact to Land and Surrounding Environment**

Artisanal and small-scale mining severely alters the landscape, which reduces the value of the natural environment in the surrounding land. If mining is allowed, resident human population must be resettled off the mine site; economic activities, such as agriculture or hunting and gathering food and medicinal plants are interrupted.<sup>cxxvi</sup> Mining and allied activities have caused severe damage to the land resources of the tribal areas. The forests and agricultural lands belonging to the tribal people have been laid waste because of haphazard mining. In essence, negligence favours landslides that destroy the environment or cause human casualties because some miners either gets buried alive when there are landslides or drown during rainy seasons when the holes are filled with water. What is the provision of the Law? The position of the law is that the soil and the sub-soil as well as the limited renewable resources contained therein, shall be protected against any forms of degradation and jointly managed rationally by the

competent administrations.<sup>cxxvii</sup> This therefore implies that any destruction of the soil or sub-soil that will lead to the degradation to land is an offence and must be sanctioned according to the law. In this while, artisanal miners in NMF and TNS areas need to be sanctioned for violating the law.

### **7. Impact on Fishing**

Fishing is an old activity in the NMF and TNS, which has gained more impetus with the advent of mining. In carrying out mining, miners enlarge small ponds and put together all the conditions necessary for fish to proliferate. Both men and women practice it. Species of fish caught include tilapia (*Oreochromis niloticus*) and mudfish. It is worth noting that some miners in Zambata usually make up to XAF 30.000 a month during the dry season when there is an abundance of fish.<sup>cxxviii</sup> According to some sources, in just some few months, artisanal and small-scale (illegal) mining activities damaged the ecosystem by killing the entire fish population in the river after water-pumping machines leaked toxins into the water.

However, even with current regulations, surface mining can affect fish and aquatic resources through erosion and sedimentation, dewatering of wetlands, diverting and channelizing streams, and contaminated surface water and aquifers with toxic chemical. These negative effects can occur with unregular mining or when a company does not follow its mining plan. The result is a loss of sensitive species, biodiversity, and ecosystem integrity. Changes occur in the productivity of aquatic ecosystems through effects on reproduction, growth, behavior, and migration, the accumulation of contaminants in fish may render them unsuitable for human consumption. Chemical pollution can result in a complete and “permanent” loss extending far downstream. Although some impacts, such as increased erosion, are generally associated mining, others are directly related to specific mining industries and geographic region. The needed action here is that the government of Cameroon has endorses the conservation of energy by greater efficiency and where it appropriates the use of renewable resources.<sup>cxxix</sup> According to Cameroonian law, it forbids the pouring or discharging into the aquatic environment of toxic or noxious materials such as industrial, agricultural or domestic waste and pollutants into water.<sup>cxxx</sup>

## **CONCLUDING REMARKS**

In conclusion, mining is a lucrative activity. Miners earn relatively high incomes in shorter time periods. Though a beneficiary activity, mining is a geographically concentrated activity which results in a number of negative impacts on both the immediate vicinity and distant areas. These effects include water and air pollution, river and dam siltation and loss of biodiversity (deforestation, overfishing and poaching). As a result, there are a number of extinct and threatened species in the forested area. Indeed, impacts such as the destruction of fragile forest ecosystems such as forest swamps; diversion; sedimentation and pollution of river courses; and soil destruction. Summarily, the presence of artisanal and small-scale miners inside the forested areas of Ngoyla-Mintom forest and the Sangha Tri-National Park Landscape aggravates activities such as poaching, with the killing of endangered species such as gorillas and elephants. Miners fell trees on considerable surfaces of land in order to mine and build up settlements inside the forest. The environmental impacts of artisanal gold and diamond mining and the secondary activities it generates in the NMFM are still on a small-scale but will have adverse effects if mining activities continue to gain ground and unprotected stakeholders who need to comply and enforce the existing laws in this sector.

Brief, artisanal mining relies on its ability to meet demand without engaging with regulations. While ethical regulations focus on the supply side, Matson told a recent panel that: demand for minerals produced in forests continues to rise and the countries that consume these commodities have so far taken new steps to limit the impact of that demand.

## **KEY RECOMMENDATIONS**

It is a pity that artisanal miners generally work clandestinely. They do not know about the legal provisions in force. All measures for the exploitation of mining and forestry warrants that all those involved in this activity should benefit from a legal backing. In fact, the registration of sponsors, miners and collectors poses specific problems. In other words the long term advantages of having a prospector's card should be explained to miners. It is in this light that we submit that there is a great need to sensitize artisanal and small-scale miners about the mining code, 2016, the forestry law, 1994, other affected laws and thereby legalize their operations. The government and its funding partners are better positioned to sponsor sensitisation programmes about these gamut Cameroonian legislations.

Another submission is that of Harmonising mining policies and resource governance strategies in Cameroon. A harmonised approach to mining in Cameroon would address issues about artisanal and small-scale mining (ASM) and trans-boundary trafficking. The outcomes would strengthen existing Park-related trans-boundary agreements on sustainable management that follow the 2000 “Yaoundé declaration” signed by Central African governments.

The lack of government success in controlling ASM activities has in part been due to a tendency for regulatory frameworks to be control-oriented, few obvious benefits or incentives for miners. Artisanal and small-scale miners will only formalize and register their operations if they see some real advantages to doing so. And they will only stop mining if alternative, more attractive sources of income are available. Thus those who register might gain access to technologies and services, along with training for health and safety and for environmental management. They could also get financial assistance, as well as information on prices and access to markets – which would make them less reliant on intermediaries for the sale of their products and enable them to get better prices.

The purpose of SONAMIES shall be to develop and promote the mining sector in Cameroon. It is our submission that SONAMINES the newly created corporation be on its feet day and night to see into it that there must be compliance and enforcement of the law, without which the corporation has failed in its aims and purposes. It is our submission that SONAMINES should implement, comply and enforce the existing laws and regulations. This is because in Cameroon, we believe that government reforms are weak and slow due to poor implementation of laws on transparency of information and decision-making process especially in the Ngoyla-Mintom forest and the Sangha Tri-National Park Landscape. This may be associated with the pluralistic politics and representative government, but it also means giving citizens, or their representatives more influence in the formation and implementation of laws and policies.<sup>cxxxii</sup> If you implement something such as a plan, you ensure that what had been planned is done. In short, the concept of moving an idea from concept to reality. So, SONAMINES should be up to the task to implement the laws dealing in artisanal and small-scale mining in the Ngoyla-Mintom Forest and the Sangha Tri-National Park Landscape.

By compliance we are conforming to a rule such as specification, policy, standards or law. Regulatory compliance describes the gold that organizations aspire to achieve in their effort to ensure that they are aware of and take steps to comply with relevant laws, policies and regulations. Here SONAMINES must be proactive and not reactive.

As for enforcement, SONAMINES should enforce the laws by deterring, rehabilitating, and punishing people who violate the rules and norms of the society. Here the term encompasses policies, courts, and corrections. We strongly believe that SONAMINES will enforce these laws.

Finally, it is our submission that targeting all intervening stakeholders in the Ngoyla-Mintom Forest and the Sangha Tri-National Park Landscape, including national governments (especially all of their relevant ministerial departments), non-governmental organisations, business entities and development agencies to promote development policies that stimulate environmentally sound mining practices in the Ngoyla-Mintom forest and the Sangha Tri-National Park Landscape, such as maintaining chemical-free mining practices.<sup>cxxxii</sup>

## ENDNOTES

<sup>i</sup> In Cameroon, gold mining started in 1933 and totalled about 20 tonnes between 1934 and 1984. For details, see, Lang, C., 2007 L'Or Camerounais mal exploité. *Le Messager*. Available at: [http://www.cameroon.info.net/cmi\\_show\\_news.php?id=19684](http://www.cameroon.info.net/cmi_show_news.php?id=19684) (Retrieved 27 July, 2021).

<sup>ii</sup> As concern the Sangha Tri-National Park (TNS) Landscape this article comment only on Cameroon with the exclusion of the Central African Republic and the Republic of Congo that make up the (TNS).

<sup>iii</sup> Labonne, B. and Gilman, J., *Towards Building Sustainable Livelihoods in Artisanal Mining Communities*, In Proc. From the Tripartite Meeting on Social and Labour Issues in Small-Scale Mines, Geneva, Switzerland, 17-21 May 1999.

<sup>iv</sup> An Artisanal miner or Small-Scale miner (ASM) is a subsistence miner who is not officially employed by a mining company, but works independently, mining minerals using their own resources, using by hands. For more information, see [https://en.m.wikipedia.org/wiki/List\\_of\\_mining\\_companies](https://en.m.wikipedia.org/wiki/List_of_mining_companies) (Retrieved 19 March, 2022).

<sup>v</sup> Willy C. F. Jaff N.B., *Artisanal Mining, A Challenges to the Kimberley Process: Case Study of the Kadey Division, East Region of Cameroon*. RELUFA, January, 2013.

<sup>vi</sup> Available at: [www.casmsite.org](http://www.casmsite.org) (Retrieved 21 March, 2022).

<sup>vii</sup> By forested areas here we mean; The Ngoyla-Mintom (NMF) forest and the Sangha Tri-National Park (TNS) Landscape.

<sup>viii</sup> Opt. cit.p.21.

<sup>ix</sup> "Illegal Mining" Available at: <https://www.fws.gov/international/wildlife-without-borders/afra/illegal-mining.html> (Retrieved 22 March, 2022)

<sup>x</sup> Hentschel, T., Hruschka, F., Priester, M., "Artisanal and small-scale mining: challenges and opportunities". International Institute for Environmental and Development, London. Available at: <http://pubs.iied.org/9268IIED/> (Retrieved 19 th March, 2022).

<sup>xi</sup> "Illegal Mining" Available at: <https://www.fws.gov/international/wildlife-without-borders/afra/illegal-mining.html> (Retrieved 22nd March, 2022).

<sup>xii</sup> [MINFOF] 2006. Proposition de gestion des UFA geles en exploitation pour la conservation. Rapport MINFOF, Yaounde/Cameroon.

<sup>xiii</sup> Kevin, N.F., *The Impacts of artisanal gold mining on Local livelihoods and the Environment in the Forested areas of Cameroon*. Working Paper 150. Bogor, Indonesia: CIFOR. 2014, p.3.

<sup>xiv</sup> Ibid.

<sup>xv</sup> Letouzey. R., *Notice de la carte phytogéographique du Cameroun au 1/500000*. Institute de la cartographie internationale de la végétation. Toulouse, France, 1985.

<sup>xvi</sup> Ibid.

xvii Ibid.

xviii It was added as a UNESCO World Heritage Site in 2012 because of its outstanding biodiversity and unique biological communities.

xix “Sangha Trinational|World Heritage Outlook” Available at: <https://worldheritageoutlook.IUCN.org/explore-sites/wdpaid/555547988>. (Retrieved 9th October, 2021).

xx Tieguhong, J.C, Verina, I and Jolien S., Impacts of artisanal gold and diamond mining on livelihoods and the environment in the Sangha Tri-National Park (TNS) Landscape, Congo Basin, Yaounde-Cameroon: CIFOR 2009..p.7.

xxi Ibid, p.4.

xxii Ibid.

xxiii Ibid.

xxiv Ibid, pp. 4-5.

xxv Ibid, p.5.

xxvi Ibid.

xxvii CBFP 2006 The Forests of the Congo Basin : State of the forest 2006 Brazzaville, Congo Basin Forest Partnership 2006.

xxviii Opt, cit. p.5.

xxix Nki National Park (Parc national de Nki, also called, Reserve de Nki) is a national park in southeastern Cameroon, located in the East region of Cameroon.

xxx Ibid.

xxxi Nzooh, D.Z., Dynamique de la faune sauvage et des activites anthropiques dans la Reserve de Biosphere du DJA et ses environs (Cameroun). Volume 1. MINEF-ECOFAC. 1999.

xxxii Ibid.

xxxiii World Bank.2013, Conservation and sustainable use of the Ngoyla-Mintom forest massif. Accessed January 2014. [www.worldbank.org](http://www.worldbank.org). In Kevin N.F., The Impact of artisanal gold mining on local livelihoods and the environment in the forest areas of Cameroon, p.5.

xxxiv Tieguhong, J.C, Verina, I and Jolien S., Impacts of artisanal gold and diamond mining on livelihoods and the environment in the Sangha Tri-National Park (TNS) Landscape, Congo Basin, Yaounde-Cameroon: CIFOR 2009. p.7.

xxxv Ibid.

xxxvi Opt. Cit.p.17.

xxxvii Ibid.

xxxviii Section 36, Cameroon Mining Code 2016.

xxxix Forjindam D. M., Artisanal And Small-Scale Mining In The East Region Of Cameroon: An Overview. Commonwealth Law Review Journal. Annual Volume 7. The Law Brigade Publishers . 2021.p.331.

xl Decree N° 2020/749 of 14 December, 2020 to set up the National Mining Corporation abbreviated and herein referred to as “SONAMINES”. Article 4 (1), of this Decree of 14 December, 2020 has clearly spelt out the duties of SONAMINES.

xli Article 2, Decree N° 2020/749 of 14 December 2020.

xlii Article 3, Decree N° 2020/749 of 14 December 2020.

xliiii Article 4, Decree N°2020/749 of 14 December 2020.

xliv Article 4, (para. 6) Decree N° 2020/749 of 14 December 2020.

lv Law N° 2016/017 of 14 December, 2016 on the Mining Code of Cameroon.

lvi The mining code was voted by the national assembly and promulgated by the head of State under Law N° 001 of 16 April 2016 and Application Decree N° 2002/046PM 26 March 2002 signed by the Prime Minister.

lvii Section 136, Cameroon Mining Code, 2016.

lviii Section 50 (1), Cameroon Mining Code, 2016.

lix Section 50 (2), Cameroon Mining Code, 2016.

l Section 127 (b), Cameroon Mining Code, 2016.

li Section 135 (1), Cameroon Mining Code, 2016.

lii Cerutti, P.O., Nasi R and Tacconi L., Sustainable forest management in Cameroon needs more than approved forest management plants. Ecology and Society 13 (2):36, 2008.

liii Law N° 94-01 of 20 January 1994 Regulating Forests, Wildlife and Fisheries.

liv Decree N° 95-53-PM of 23 August 1995.

lv Section 20-39, Cameroon Forestry Law, 1994.

lvi Section 22 (1), Cameroon Forestry Law, 1994.

- lvii Section 20 (2), Cameroon Forestry Law, 1994.
- lviii Op. Cit. p.8.
- lix Section 1, Cameroon Forestry Law, 1994.
- lx Article 2 (2), Cameroon environmental and Management Law, 1996.
- lxi Law N°2016/017 of 14 December 2016 on the Cameroon Mining Code of 2016.
- lxii N° 94-01 of 20 January 1994 regulating forests, wildlife and fisheries in Cameroon.
- lxiii Lobéké National Park of Southeastern Cameroon within the Moloundou Sub-division of East Region. Located in the Congo basin, it is bounded on the east by the Sangha River which serves as Cameroon's international border with Central African Republic and the Republic of the Congo. (Available at: "Lobéké National Park – Wikipedia" [https://en.m.wikipedia.org/wiki/Lob%C3%A9\\_National\\_Park](https://en.m.wikipedia.org/wiki/Lob%C3%A9_National_Park) , (Retrieved 9 November, 2021).
- lxiv Boumba Bek National Park is a National Park in Extreme Southeastern Cameroon, located in its Eastern Region. It was not formerly established as A National Park, however, until the Cameroonian government decreed the creation of boumba bek and Nki National Park on 17 October 2005. (Available at: "Boumba Bek National Park-Wikipedia" [https://en.m.wikipedia.org/wiki/Boumba\\_Bek\\_National\\_Park](https://en.m.wikipedia.org/wiki/Boumba_Bek_National_Park) (Retrieved 9 October, 2021).
- lxv Nguiffo and Nguempjoo., 2009. In Kevin, N.F., The Impacts of artisanal gold mining on Local livelihoods and the Environment in the Forested areas of Cameroon. Working Paper 150. Bogor, Indonesia: CIFOR. 2014. pp 8-10.
- lxvi Section 126 (1), Cameroon Mining Code, 2016.
- lxvii Section 126 (2), Cameroon Mining Code, 2016.
- lxviii Section 135 (1), Cameroon Mining Code, 2016.
- lix Section 16 (2), Cameroon Forestry, Wildlife and Fishery Law, 1994.
- lxx Section 11, Cameroon Forestry, Wildlife and Fishery Law, 1994.
- lxxi Section 11, Cameroon Forestry, Wildlife and Fishery Law, 1994.
- lxxii Section 17 (2), Cameroon Forestry, Wildlife and Fishery Law, 1994.
- lxxiii Section 150 (1), Cameroon Forestry, Wildlife and Fishery Law, 1994.
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- xcix Section 127, (g), Cameroon Forestry, Wildlife and Fishery Law, 1994.
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- cv Section 137, 2016 Cameroon. Mining Code.
- cvi Section 80, Cameroon Forestry, Wildlife and Fishery Law, 1994.
- cvi Section 81, Cameroon Forestry, Wildlife and Fishery Law, 1994.
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