



The Environmental and Sanitary Impact of Artisanal and / Or Industrial Mineral Exploitation in Rdcongo



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Abstract

Mining activity is artisanal or industrial mining RD Congo especially in the mining provinces of the eastern part of the country poses several impacts on the environment both human and fauna and flora. During our research, we found that there are several victims representing different social strata of which adults and also children are part of the number. Our study shows that there are several environmental and health impacts associated with mining, whether artisanal or industrial. The change in ecosystem parameters and balances relates to biological diversity, visual aesthetic qualities, landscape change. The anomalies created by different mining operations have a direct impact on the environment and are naturally found on the ground by various modifications of either fauna or flora. Runoffs provide a source of suspended matter (impact on flora, natural fauna, fisheries), a source of flying dust (pollution of the habitat by fine particles), waste rock (for quality aesthetic), and chemical contamination has an impact on groundwater, surface, on the ground. The impact on the health of the population and children is manifold. Cases of allergy, lung problems, musculoskeletal disorders (TMS), hypertension, blue-gray skin tone in some children have often been reported.

Keywords: Impact; Environmental; Health; Exploitation; Mining; RD Congo

Introduction

For many years, the economic activity of RD Congo was based on the extraction of natural resources. This has resulted in environmental degradation and the most visible aspect is deforestation, loss of biodiversity and pollution. This situation is exacerbated by the inadequacy of the state to regulate the mining market and the predominance of the informal economy (which is based on the exploitation of natural resources with serious social and environmental impacts) environmental impact assessment during mining operations must take into account the evolution of the work since the opening of a research permit from the zone concerned until its closure; if and only if, the latter has been exploited.

This presupposes that the impact of mining work on the environment must be studied before starting all possible works in the said zone and plan after the closure of works in this zone what risks and impacts the environment and how to cure it. It then follows a large-scale challenge that man must understand in order to restore nature to its original state as found before

all kinds of work that may involve the pollution of flora, fauna, water and even noise pollution can be generated by the noise of various mechanical equipment such as heavy machinery and equipment used during work in the areas and sites concerned. An industrial or artisanal exploitation has several consequences on the environment, so we will detail in our study where man is at the center of the exploration and Exploitation Company and the first polluter some aspects in different relationships environmental impacts.

Concepts and Definitions

Exploitation (artisanal or industrial): It is the action to put a few things in value in order to profit from them; to ensure the production of a material, ore or product. Some phases in a mining project involve prospecting, development, active underground or open pit mining, evacuation of land or rock waste, ore mining, enrichment; the disposal of tailings and finally the rehabilitation and closure of mining sites. Each mining phase is associated with different groups of environmental impacts [1].

A mine: A mineral or fossil concession able substance contained within the earth or existing on the surface; all the installations necessary for the exploitation of a deposit. It is also a deposit of materials that can be either underground or open pit. The difference between a mine and a quarry lies in the types of materials to be extracted: if it is considered valuable, it is called a mine and, if not, it is called a quarry (building materials).

Impact: According to the dictionary, impact is an effect produced by something or an influence exerted by someone like the effects of mining on the environment.

Environment: What surrounds us," what constitutes a neighborhood ". It is indeed our ecosystem it could be specified that it is the set of natural or artificial elements that condition and can modify the life of a living being, a species. The environment is also an interaction with another element of our ecology such as air, water, landscapes, some of which are very far apart.

Risk: It is the possibility, probability of a fact, of an event to be considered as an evil or a damage; in other words ; a probable danger or inconvenience to which one is exposed, in short a peril. It must be said that the risk is a probability of occurrence of the danger followed by its gravity and the effects that are linked to the appreciation of the individual. Danger, on the other hand, is a cause capable of causing any attack on the physical and / or mental integrity of the individual, all that can degrade the goods and the environment. Let us then say that risk is worth the danger and exposure [2,3].

Mining Residues: All solid or liquid substances discharged through the extraction, preparation, enrichment and separation of an ore including sludge and dust resulting from the treatment or purification of mineral waste water or atmospheric emissions are excluded in the definition of residues discharged through quarrying or quarries and sand pits. (Directive 019 on the mining industry, November 2004).

Objective of the study

Our objective is to evaluate the impact of artisanal or industrial mining on the environment as well as on the workers

and surrounding populations located around the mining sites by segregating the positive or negative sides. Our study of observation and field surveys wants to inform and sensitize different partners on the problems and dangers that the mining activity can cause, the releases emanating there and their effect likely to be correlated with the pathologies which can create diseases in artisanal workers called diggers and the deterioration of the environment. Specifically, the second objective is to characterize the mining discharges that cause damage to the health of the population and the environment.

Methodology

This study is exploration, field investigation and bibliography. Indeed, it is difficult to approach open-pit mines in R & D. Congo because often the safety problems around the different quarries and sites are necessary. The aim of the field trip was to collect the data through a visit to the quarry with the constraint that there is no data produced in advance or cadastral zed by the State. Thus, we conducted direct observations on the treatment and management of tailings and, lastly, the interview with the diggers, which is the population at the heart of artisanal exploitation and which also depend on the industrial picking on various embankments in a clandestine manner. However, the open-cast mines in DR Congo are for the most part surrounded by artisanal miners who have allowed us to obtain different information contained in this research.

Results

Our observations, the first step in the establishment of a mining facility, is prospecting: it is necessary to detect sites that may be mineralogical interesting by conducting geochemical studies and surveys [4] as mentioned above, is not the case in the case of artisanal mines. In this crucial step the notion of reserve is involved. The geologist having studied the deposit and knowing it partially transmit all the information in his possession to the miners, metallurgists and financiers for the establishment of the exploitation project. For this purpose, it estimates reserves (quantities of useful mineral substances in the explored deposit) [5].



Figure 1: On the left the artisanal mining of Kadumwa (Source: Twangiza Mining) South Kivu. On the right the diggers of Wamba-Haut Uélé (Source: A. Monikotidoo) Province Orientale / RDCongo.

This is not the case when it comes to an artisanal farm where the geologist does not exist. Our observations, the first step in the establishment of a mining facility, is prospecting: it is necessary to detect sites that may be mineralogically interesting by carrying out geochemical studies and surveys [4] as mentioned above, is not the case in the case of artisanal mines. In this crucial step the notion of reserve is involved. The geologist having studied the deposit and knowing it partially transmit all the information in his possession to the miners, metallurgists and financiers for the establishment of the exploitation project. For this purpose, it estimates reserves (quantities of useful mineral substances

in the explored deposit) [5]. This is not the case when it comes to an artisanal farm where the geologist does not exist. When observing the artisanal mine, many people are employed, many people give themselves to this activity without hygiene or safety required. [6] This involves serious consequences for health and damage to the environment where several holes can cause landslides and landslides, without forgetting the erosions that can buried alive the artisanal workers called diggers who can cause imminent death if the aid does not intervene in the fastest possible way (Figure 1).



Figure 2: On the left of the children in the open mining sites (J. Kumwimba source / Kolwezi sector) on the right (Source B.Lulali: Sector of Lualaba-RDCongo).



Figure 3: left the waste rock stack and right mining residue dumped in the form of pulp.

Children and adults work in mining sites as shown in photo 2, which poses a health problem because young people are in the presence of pollution by dust, noise and other physical risks and illiteracy. These children, following the economic crisis and the unemployment of the parents, spend several hours per day and nights digging, washing and transporting the ore (Figure 2). Even for organized societies (Figure 3), when minerals are mined, gold, copper and other bauxites naturally pose risks to health and the environment. The mining residue is considered as a residual material generated by an industrial mining activity. It is of mineral origin (containing more than 50%) of recycled materials. This term should stop at the mining sector but also comes from mining, enrichment or processing of an ore (Figure 3).

Discussion

The small-scale, small-scale mining sector is the largest segment of the mining industry in the Democratic Republic of the Congo, not only because it produces a large volume of mineral substances, but also because of the number of people who depend on it. As shown in photo 1, we see a first attack on the environment; it is the denaturation of landscape which is accompanied by deforestation. The consequence is the duality of biodiversity towards mining, the change in visual esthetic qualities. As a matter of course, the site is situated in a context of natural anomaly [7]. A study by PACT [8] shows that more than 400,000 artisanal miners are active in all corners and provinces of RDCongo.

There is not a census in the mining sector only such figures draw the attention of legislator on the social importance of this sector. It is also from an economic point of view a shortfall because many individuals depend on this sector of activity. Several problems arise with regard to supervision and follow-up of work for the protection of the environment in view of the number of the population that is engaged in this activity. The author Seydou. K describes some problems related to the negative impacts such as hygiene, safety, health (of musculoskeletal disorder, MSD appears in the diggers and intense pain to the limbs of which we do not know not due to lack of working physicians).

What the photo1 shows us to the right corroborates the idea developed above. Minors usually set up spontaneous villages near the extraction sites; they shelter themselves in huts of branches and straw those have no convenience and do little to protect them from the weather. These shelters are devoid of any hygienic infrastructure. Extraction sites are often isolated in the bush and do not have a health center or medical staff. The wounded and sick have to travel long distances in difficult conditions to reach a health center.

To "take courage", artisanal workers in the fields of gold, copper, diamonds and other profitable minerals, young and adult, consume alcohol, amphetamines, narcotics or sometimes inhale glue. This is another form of health risk for a minor that jeopardizes their health. Moreover, the massive influx of diverse populations on the sites, due to the appetite for easy and rapid enrichment, leads to a rapid degradation of mores at certain sites. For example, prostitution, drug use, delinquency, fraud, banditry and even crime tend to develop. As for the health risk at the workplace level, given the arduous working conditions, are risk factors conducive to the spread and proliferation of diseases at mining sites such as malaria, acute respiratory infections, trauma, diarrhea, dermatosis and sexually transmitted diseases.

Added to this is the consumption of foodstuffs manufactured in the form of preserves, which are most often poorly packaged. From this point of view, it is evident that malnutrition characterizes digging sites. There is a strong migration as the site is not permanent, in the so-called abusive miners. Indeed when the mine no longer produces one advance in the forest for the search without prospection beforehand. This advance produces waste that is not known to be stored, which will avoid polluting their work area. During the field trip, we found several children and adults working in mining sites (Figure 2).

The health risks are great for these children who are assigned for several hours a day to dig, wash and transport ore. Because of the presence of their mothers on the sites, babies are exposed from the earliest age to the dust and noise of drumsticks to reduce the granulometry of the blocks of rocks. Among the physical hazards and constraints children face at mining sites, we note lung disease due to fine dust; the risks of deafness due to permanent noise from the pestle or hammer; fatigue and intense

efforts to crush and crush or the risk of injury from stone chips in the eyes; various eye and dermatological conditions.

Another danger of working in the mine is almost social. Indeed, at the educational level, school wastage characterizes mining sites and children are the first victims. In general, children living in mining villages do not go to school and the few educational structures around the sites are often deserted and emptied by the madness of finding minerals even at the cost of losing one's life. Thus, the children enter the depth holes without realizing the risk of landslide. Some children flee the school themselves to try their luck this results in a fragile family. Under these conditions, children suffer and live in a family atmosphere disrupted by disputes, alcoholism and domestic violence, as Human Right Watch states [9].

Adds the problem of asphyxiation when they are deep without protection in sinuous and irregular holes in the ground. Here too his children inhale dust and other harmful products. Our observations lead us to see what is rejected in the environment and constitutes a risk. The installation of any mine (open pit or underground) disrupts the natural balance of these particular sites. In addition, it should be noted that mineral processing and treatment plants are mostly located directly adjacent to mine shafts, and many toxic chemicals are used [10].

These products are obviously a major hazard to the mine environment. In addition, it is clear that the nature of the mined ore is decisive for the characterization of these risks. Indeed, we fear the pollution of a water table by different minerals that one can meet in a given zone (Figure 3). Mining affects freshwater basins through the use of water for ore processing and by pollution from landfill discharges. More and more mines threaten the water sources on which we all depend. Many mining operations began extraction with little concern for the environment.

Water pollution caused by mining can take decades even centuries before being cleared after mine closure. Indeed, there is a proven impact on the environment by the pollution of a water table by different minerals that one can meet in a given zone. Mining affects freshwater basins through the use of water for ore processing and by pollution from landfill discharges. By observing all the photos, the environmental problems are multiple such as the stacking of tailings volumes in the artisanal open-pit mines, the disposal of residues and finally the generation of residues following the treatment and the concentration of the mimeras (case of the industrial exploitations).

Mining residues dumped in the form of pulp also have an impact on the environment (water, soil, water table, flora, air, etc.) and other health impacts (cancer, typhoid fever etc.). We have tried to characterize the mining waste in order to demonstrate its polluting capacity and to determine the environmental impacts [11]. The environmental impact of mining rejection is exacerbated by the hot climate (heat) and acid mine drainage

has been identified. The main dispersion vector from mining discharges is related to the presence of contaminating suspended particles [12]. In the vicinity of the soil, the contamination is also related to Zn at a concentration of 3000ppm, Cu (85ppm) and Cd (1.30ppm).

Conclusion

Whether open-pit or underground, artisanal or industrial mining brings about the disturbances and imbalances that are likely to affect not only the air-water-soil ecosystem but also the human and socio-cultural environment. We retain the loss of natural vegetation, wildlife habitat, and soil and vegetation degradation such as mass deforestation and accelerated erosion, disruption of biodiversity and subsidence of soil, loss of panoramic view as the operation moves a quantity of rock and waste rock. Chemical treatment in the final phase with the use of chemicals has an impact on humans, fauna, and flora and water resources. The positive impact that must be pointed out is that mining, whether artisanal or not, employs about 3,000 million people in the world [13]. This industry helps to reduce poverty, and brings foreign currency to the country's economy [14,15]. Artisanal farms do not develop the local economy, it is more the large mines because they provide training, public services, education, health services (distribution of clean water, transport, energy and infrastructure sectors, such as Gecamines in DR Congo, and other companies in South Africa, China, the USA and Russia. raise the standard of living of the surrounding population. Another not insignificant factor is the rural exodus which brings with it a new cultural development and a symbiosis of the different communities that will share their knowledge if only if the communities accept each other. It is also a positive impact that can be attributed to mining operators. Finally, our study recommends that mining residues be reworked as they can be revalorized for the recovery of some metals such as Pb, Cd, Cu, Co.

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