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From agricultural practices to mining activities: The consequences of the paradigm shift for the food security in Guinea

Dalle pratiche agricole all'attività estrattiva: le conseguenze
di un cambio di paradigma per la sicurezza alimentare in Guinea

This study aims to analyse the effects that the mining activity exercises on agriculture and the livelihoods of local communities in the Republic of Guinea. Mining and agricultural activities are intertwined in such a way that the operation of one affects the other. Over the years, mining activities have been seen to negatively affect farming, livestock grazing and fisheries in the surrounding communities. Mining consists in the excavation of useful and economically valuable minerals from deposits in the earth. Despite its potential to generate a large amount of revenue, the mining sector is not adequately regulated, and as a consequence creates a ground for illegal mining activities. These activities, depending on the type of mining, have a spectrum of effects on agricultural activities including competition for land control and use, pollution of water bodies and exposure of crops and livestock to the harmful effects of heavy metals. The cumulative effects of these activities have modified the agricultural practices, disrupted landscapes, and negatively influence the availability of food crops in the areas where mining activities are carried out, which in turn threatens the food security of the region of Boké. This article also evaluates the impacts of mining on agricultural activities in the region, with a view of providing evidence for policymakers for taking necessary action and foster sustainable solutions.

Keywords: mining, agricultural activity, food, Guinea, region of Boké, households

L'articolo si propone di analizzare l'impatto che le attività minerarie hanno sull'agricoltura e sui mezzi di sussistenza delle comunità locali nella Repubblica di Guinea. Lo sfruttamento dei giacimenti e le attività agricole sono interconnessi tra loro in modo tale che il funzionamento dell'uno incida sull'altro. Nel corso degli anni, è stato possibile osservare che l'attività mineraria ha avuto un impatto negativo su quella agricola delle comunità circostanti, nonché sul pascolo del bestiame e sulla pesca. Nonostante un suo potenziale di generare ingenti entrate, il settore minerario non è stato adeguatamente regolato, il che favorisce attività minerarie illegali. A seconda del tipo di estrazione mineraria svolta, si crea una serie

di effetti sull'agricoltura, come dover competere per il controllo e uso del territorio, problemi di inquinamento dei corpi idrici e di esposizione delle colture e del bestiame ai metalli pesanti con effetti dannosi sulla salute. Gli effetti cumulativi di queste attività hanno portato a cambiamenti in agricoltura, sconvolto il paesaggio e influito negativamente sulla disponibilità di colture alimentari nelle aree in cui sono presenti attività minerarie. Ciò minaccia la sicurezza alimentare della regione di Boké. Gli autori sottolineano la necessità di introdurre soluzioni che aiutino a trovare un equilibrio tra le due attività.

Parole chiave: settore minerario, attività agraria, alimentazione, Guinea, regione di Boké, nucleo familiare

Introduction

Bauxite mining is booming in Guinea which is one of the poorest countries in the world. Since 2015, the government has made this West African country one of the world's leading bauxite exporters, and the largest exporter of this mineral to China, the world's leading producer of aluminium. Bauxite from Guinea now represents a large part of the aluminium produced internationally and intended to provide for all kinds of industries in developed countries.

The Boke region in northwest Guinea is the focal point of recent growth in the mining sector. The region today has dozens of open-air bauxite quarries, which easily stand out from the green Guinean landscapes with their red-coloured soil. Industrial ports, where bauxite is loaded onto barges or ships for export, are located next to mangroves, rice fields and small fishing ports on which local communities base their livelihoods. Although the booming development of the bauxite sector brings much-needed tax revenue to the government as well as thousands of jobs and profits to mining companies and their shareholders, it also has serious consequences on the communities' agricultural sector and the lives of rural people in households near the locations of activities linked to the exploitation of bauxite ore. Mining companies take advantage of the ambiguous protection of rural land rights under Guinean law to expropriate ancestral agricultural land without providing adequate compensation, or by making financial payments that do not compensate for the profit that the communities would have derived from the land.

The damage caused to water sources and attributed by local populations to mining, as well as the demand caused by the influx of migrants to mining areas, reduce access to the water on which communities depend, their daily lives and their agricultural activities. Water scarcity means that mainly women, who are most often responsible for water collection, must walk greater

distances or wait for long periods to access alternative sources. The dust produced by the exploitation and transport of bauxite invades homes and fields, causing concern among farmers. A few farmers from several villages located near the mining companies' extraction sites, roads and ports have described their miseries caused by the hellish way they are treated by the mining giants.

In Africa in general and in Guinea in particular, the ownership of rural lands is organised in accordance with customary (or traditional) law. This recognises the rights of a family, a lineage or a community, to the land based on its historical link with it. Although the Guinean land code can be interpreted as recognising customary rights, in practice, communities or individuals occupying land under customary law must register their property or ensure that it is recorded in land plans to be able to benefit from legal protection. Very few farmers have followed these procedures, largely due to the government's failure to implement its rural land policy, aimed at facilitating the demarcation, registration and protection of land in rural areas.

Since the adoption of the 2011 Mining Code,¹ the Guinean government has not adopted any regulations that establish uniform compensation standards for land acquisition in the mining sector, a missed opportunity to more explicitly protect customary land rights: farmers and rural communities. In the absence of clear protection for customary land rights, mining companies often assert that land remains, in legal terms, "the property of the state," which has given them the right to exploit it. This erroneous interpretation allows mining companies to acquire land without the consent of farmers or without adequately compensating them. Although compensation paid by mining companies – sometimes to the community as a whole, and sometimes to individual farmers – can represent a windfall in the short term, it is difficult for those practising subsistence farming to use this money to access sustainable sources of income. Several farmers explained that the impact of land loss was compounded by the damage caused by mining to the remaining agricultural land and other sources of livelihood, such as fishing. According to community leaders, mining companies are rarely willing to acknowledge that they are responsible for the decline in productivity of agricultural land or the decline in income from fishing, and they pay compensation only insignificantly and sporadically.

¹ Code minier du 9 septembre 2011 (adopté par le CNT), partiellement amendé par la Loi L / 2013 / 053 / CNT du 8 avril 2013, portant amendements de certaines dispositions de la Loi L / 2011 / 006 / CNT du 9 septembre 2011 portant Code minier de la République de Guinée du 8 avril 2013.

Another harmful aspect of this extractive activity which affects communities, is the unequal treatment of men and women. Although women participate in agriculture on an equal basis with men, most of the compensation paid for plots that belong to a family or community is paid to men who play a leadership role within the family or the community. The land on which men and women depend and which they exploit is therefore replaced by sums of money paid to a handful of community leaders and heads of families who are mainly men. While some men are able to obtain jobs in mining companies to replace the source of income they have lost, it is rare for women to be employed by these companies, even though they are often responsible for finding alternative sources of food for their families due to the loss of revenue caused by mining activities.

Land is and has always been the source of subsistence income for local communities. Deprived of their land, local communities become vulnerable. Both artisanal and industrial mining take land away from agricultural producers. The recent advent of the mining boom in the Republic of Guinea has only worsened the precarious situation of agricultural producers. All the cases studied demonstrate the priority given by those in power to the mining sector over agriculture.

This study aims to analyse the effects of mining activity on agriculture and the livelihoods of local communities in the Republic of Guinea. To achieve the set objectives, the following research hypotheses will be emphasised in the paper. Firstly, the sources of livelihood of the communities studied are the agricultural lands from which they derive their income. Mining has considerable impacts on the environment, such as site degradation, destruction of vegetation and disappearance of native fauna. Its high consumption of water, its use of toxic products (cyanide, mercury, etc.) and the intensive nature of this exploitation explain that it has a considerable and long-term negative impact on the environment and biodiversity in general and water in particular. Secondly, industrial mines cause the displacement and resettlement of affected populations, leading to a deterioration of social collaboration, particularly mutual aid. Furthermore, communities in mining host sites perceive that the influence of mining on living conditions is both positive (improved income, creation of jobs and infrastructure, etc.) and negative (degradation of the environment thus jeopardizing agro-pastoral production, etc.).

1. The economic weight of agriculture in rural and peri-urban areas

Agriculture has long been recognised as playing a central role in growth and development.² Its importance is also increasing in developing countries, where a large part of the population depends on agriculture for their subsistence. These countries are characterised by a significant share of agriculture in their GDP and a strong dependence on exports of raw materials. It therefore appears necessary to focus on the role of agriculture as a pillar of their development.

The Republic of Guinea, although ranked last in the 2018 United Nations Human Development Index, is full of enormous natural resources.³ The country, in addition to benefiting from gigantic areas of very fertile arable land, a large African water reserve and a large massif of tropical forests, has significant mineral wealth. Agriculture is locally considered a marginal activity, especially among young people. They consider mining as the only activity that can contribute to their development and is likely to boost the development of their environment. By comparing the price of minerals to that of food products on the local market as well as the revenue from the work of the agricultural worker compared to that of the mining worker, it would seem that the young people are right to lean towards mining rather than towards agriculture. The fear is that children will grow up with this mindset of considering mining as the only source of “every chance of success in life,” a consideration likely to discourage them from pursuing formal education, whereas minerals are exhaustible resources.

As a sector with significant comparative advantages in its embryonic stage, agriculture stimulates exports, and in turn, contributes to the growth

² J. Baldy, S. Kruse, *Food Democracy from the Top Down? State-Driven Participation Processes for Local Food System Transformations towards Sustainability*, “Politics and Governance” 2019, no. 7 (4), pp. 68–80; B. Losch, *The elusive quest for inclusive growth in sub-Saharan Africa: Regional challenges and policy options*, in: L. Haddad, H. Kato, N. Meisel (eds.), *Growth is dead, long live growth: The quality of economic growth and why it matters*, Tokyo 2015, pp. 217–242; B. Rubbers, *Les sociétés africaines face aux investissements miniers*, “Politique Africaine” 2013, no. 3, pp. 5–25, <http://www.cairn.info/revue-politique-africaine-2013-3-page-5.htm> [accessed on 10.09.2023].

³ The Human Development Index (HDI) is a statistic developed and compiled by the United Nations since 1990 to measure various countries’ levels of social and economic development. It is composed of four principal areas of interest: mean years of schooling, expected years of schooling, life expectancy at birth, and gross national income (GNI) per capita. The average for 2021 based on 183 countries was 0.725 points. The highest value was in Switzerland: 0.962 points and the lowest value was in Chad: 0.394 points.

of the country's foreign exchange, by having a direct impact on improving rural income and ensuring the provision of low-cost food both in rural and urban areas, the creation and stimulation of new opportunities in the non-agricultural sector. With the emergence of the manufacturing sector, agriculture presents itself as an important contributor to poverty reduction. In addition to its contribution to food security, agriculture can also provide positive environmental services such as protecting biodiversity and sequestering carbon.

Sensitive to these merits and attracted by the success of the sector in certain Asian countries, donors and international institutions have increased programmes to promote agriculture in developing countries. However, these programmes often do not achieve their objectives, because the share of the population in developing countries that depends solely on agriculture for their survival is relatively poor compared to populations earning their income from other sectors of the economy.

Multiple studies questioning this situation lead to the conclusion that farmers are confined in a vicious circle, which is the basis of their low income and which keeps them in a dynamic of poverty. Agriculture in developing countries is characterised by low harvest and, therefore, limited yield.⁴ This situation is explained by the poor preparation of the land, which results from the lack of tools and sporadic mechanization. According to Cervantes-Godoy, this is because of limited access to the input market, which is caused either by the lack of transport or conservation infrastructure or by trade policies that are not favourable to small farmers in developing countries.⁵ The deterioration of soil quality and land insecurity also contribute significantly to low yield. In the first case, climate change and overexploitation of the land lead to the loss of its biophysical value, thus leading to the reduction of its productivity. In the second case, small landless farmers resort to land contracts

⁴ T. Badibanga, *Agricultural development in the Democratic Republic of the Congo: constraints and opportunities*, "Dounia. Revue d'intelligence stratégique et de relations internationales" 2013, no. 6, pp. 12–25; L.E. Cartier, M. Bürge, *Agriculture and artisanal gold mining in Sierra Leone: alternatives or complements?* "Journal of International Development" 2011, no. 23, pp. 1080–1099; D. Cervantes-Godoy, J. Dewbre, *Economic importance of agriculture for poverty reduction*, "OECD Food, Agriculture and Fisheries Working Papers" 2010, no. 23; O. Sangare, *Rôle de l'orpaillage dans le système d'activités des ménages en milieu agricole: cas de la commune rurale de Gbomblora dans la région sud-ouest du Burkina Faso*, Laval 2016, p. 160; A.W. Savadogo, *Dynamique d'occupation des terres dans un écosystème soumis à l'exploitation minière: cas de l'or dans la commune de Sabcé (Burkina Faso)*, Sanghor 2015, p. 56.

⁵ D. Cervantes-Godoy, J. Dewbre, *Economic importance...*

to ensure their survival; in this context, they limit their efforts to improve the quality of the soil, knowing that the plot will subsequently return to the owner.

In addition to the insufficient harvest, there are also post-harvest losses which are due to socio-economic factors, such as the lack of transport and conservation infrastructure, climatic factors, such as precipitation and temperature, or even biological factors, such as insects and parasites.⁶ In addition, there is the problem of access to output markets, which is most often an institutional problem linked to the lack of infrastructure and the commercial and fiscal policy in force, which also impacts agricultural income, which is weakened further. With low income, farmers are not able to invest in soil improvement and preparation. This low income, associated with low investment in agricultural research and extension, again implies a low return. It is the beginning of the vicious circle for farmers investing in agricultural activity and the agricultural sector which is the fundamental pillar of rural development.

It is recognised that the increase in agricultural production is an essential precursor allowing the transition from subsistence agriculture to market agriculture, synonymous with improving farmers' income and their standard of living. However, it remains clear that improvement in agricultural production can only be guaranteed by the adoption of production factors, including mechanisation. Indeed, it is currently very difficult to imagine a developed agricultural sector without equipment. Although crop yield depends on multiple factors, agricultural mechanisation is among the most important determinants.

2. From aspiration to reality: a growth through mines, an erroneous vision of development

Historically, economic models dominated by the massive exploitation of natural resources (oil, gas and minerals) are illustrated by the failure and injustice created by the deep inequality which characterises rentier systems in Africa.

This system, which has its origins in the colonial period, has today become the main economic architecture of most African countries, of which Guinea has been a full participant since 2015. It has, in fact experienced a mining

⁶ H. Affognon, C. Mutungi, P. Sanginga, C. Borgemeister, *Unpacking postharvest losses in Sub-Saharan Africa: A meta-analysis*, "World Development" 2015, no. 66, pp. 49–68.

boom since 2015 following the reform in this sector carried out by the government, which had made it the preferred destination for mining investments in Africa. This West African country, well endowed with bauxite deposits, whose reserves exceed 40 billion tonnes, is also the leading exporter of red gold on the continent, with an annual production of 70.2 million tonnes in 2019.⁷ However, the orientation of economic policies towards the massive exploitation of natural resources (mining, forestry), in which the operating companies pay billions of francs which fill the pockets of an elite close to power, symbolises the worsening of inequalities in the country as well as the fragility of the current development model based on agriculture.

However, we know that the shift towards a rentier economy essentially creates budgetary instability due mainly to the volatility of the price of raw materials on world markets. Obviously, this dependence on basic products leads to a strong overvaluation of the currency which in turn causes a stigmatisation of exports in favour of imports. Thus, according to the logic of the Guinean government, the diversification of the economy involves increasing the production structures of raw materials, which means more granting of permits to private companies and fewer environmental constraints. However, the impact of the evolution of investments and the abundance of mining revenues is struggling to transform into a real source of wealth creation and a means of diversification of the country's economy due to the misuse of public funds. Faced with galloping demographic growth, as well as the exacerbation of the climate change phenomenon that Guinea is facing, the harmonisation of mining activity with the objectives of sustainable development becomes an imperative for public authorities.

If the claim is that mining companies can and should work towards the fulfilment of economic and social rights of the people with whom they work and who are impacted by their work, what is the response of the mining industry? While there is no uniform response, quite often the response is: our purpose is not to alleviate poverty; we are not responsible for socio-economic rights; we are a profit making entity required to keep costs low and maximise profits for our shareholders. This is a *status quo* response, which is part of the capitalist political economic structure.⁸

⁷ According to the report from the Fraser Institute for the year 2019 published on February 25, 2020, the Republic of Guinea is the most attractive African country for mining investments. At the global level, the report ranks Guinea as the 20th most attractive jurisdiction in the world while the country was ranked 103rd in 2015, a gain of 83 places.

⁸ B. Meyersfeld, *Empty Promises and the Myth of Mining: Does Mining Lead to Pro-Poor Development?* "Business and Human Rights Journal" 2007, no. 2 (1), pp. 31–53.

As things stand, in most mining communities in developing countries, there is a level of dissatisfaction, disaffection and destabilisation⁹. While the popular narrative is that miners unreasonably demand higher wages that are neither sustainable nor proportionate to the worth of labour, there is a counter-narrative. This counter-narrative is that, while it is true that profits in mining often oscillate around volatile global valuation, wages are always low, even when the value of the mineral being extracted is high.¹⁰ The counter-narrative is that mining corporations seek out extractives opportunities where, *inter alia*, there are accessible minerals, labour costs are low and governance structures are weak. Mining companies enter a market with a beguiling proposal of jobs and local economic development. However, this narrative is rarely reflected in reality. How this is fixed and whether or not it is the obligation of the corporation to ameliorate impoverishment in Africa is an indisputably complex matter. But at the very least, the mining-linked economic development must be exposed as the stuff of fiction and mythology.¹¹

3. The impact of mining on agricultural production in Guinea

Guinea, located in West Africa, is a country of around 13 million inhabitants and is very rich in soil and subsoil resources. After obtaining independence from France in 1958, several regimes succeeded one another in the leadership of the State. Guinea, which has been ruled by authoritarian powers for several years, is still struggling to initiate real economic and social development.¹² Guinea has the world's largest reserves of bauxite, with

⁹ P. Collier, *The Bottom Billion: Why the Poorest Countries are Failing and What Can be Done about It*, Oxford 2007, p. 39.

¹⁰ J.R. Owen, D. Kemp, *Social License and Mining: A Critical Perspective*, "Resources Policy" 2013, vol. 38 (1), p. 38; J.P. Jönsson, N. Fold, *Mining "from below": taking Africa's artisanal miners seriously*, "Geography Compass" 2011, no. 5/7, pp. 479–493.

¹¹ B. Meyersfeld, *Empty Promises...*

¹² S. Opoku Mensah, S. Asare Okyere, *Mining, environment and community conflicts: a study of company community conflicts over gold mining in the Obuasi Municipality of Ghana*, "Journal of Sustainable Development Studies" 2014, no. 5, pp. 64–99; L. Diallo, *Industrie minière: enjeux et perspective de développement durable en Afrique subsaharienne. Cas de la République de Guinée* (thèse de doctorat), Casablanca 2014; M.C. Diallo, A. Tali, L. Traoré, *Les enjeux de la gouvernance du secteur minier en Guinée*, Conakry 2011; T. Reardon, J.E. Taylor, K. Stamoulis, P. Lanjouw, A. Balisacan, *Effects of non-farm employment on rural income inequality in developing countries: An investment perspective*, "Journal of Agricultural Economics" 2000, vol. 51 (2), pp. 266–88; O. Bamba, S. Pelede, A. Sako, N. Kagambega, M.Y.V. Miningou, *Impact de l'artisanat minier sur les sols d'un environnement agricole*

more than a third of the known deposits of the ore, as well as vast quantities of iron ore, gold and diamonds.

Most large bauxite deposits are located close to the surface, making them easier to extract. Guinean bauxite is exported to refineries around the world, including China, North America and Europe, where it is transformed into aluminium, a metal used in the manufacture of automobile and aircraft parts, or consumer goods, such as cans or aluminium foil. The negative effects of mining activity are not only considerable but also inevitable. They disrupt the environment and society and potentially generate human rights violations and conflicts.¹³

Mining activity is extremely polluting.¹⁴ On the one hand, to access precious metals, it is necessary to move large quantities of earth and stones, thereby accumulating a huge amount of waste. On the other hand, it involves the use or release of several toxic chemicals in its process. Finally, and above all, it requires abundant consumption of water which, moreover, it contaminates. In this sense, the mining industry contributes to the double phenomenon of land and water grabbing, thus entering into direct competition with peasant agriculture. For example, almost a third of the territory of the Boké Region is under mining concession and a very large part of the national territory is affected by mining. So much land and water were confiscated from peasant agriculture. From a rice producer in the 1970s/1980s,

aménagement au Burkina Faso, “Journal des Sciences” 2013, no. 3(1), pp. 1–11; L.E. Cartier, *Livelihoods and production cycles in the Magasy artisanal ruby-sapphire trade: a critical examination*, “Resources Policy” 2009, no. 34, pp. 80–86; P. Tschakert, *Recognizing and nurturing artisanal mining as viable livelihood*, “Resources Policy” 2009, no. 34, pp. 24–31.

¹³ I. Camara, J. Deyi, O. Barry, F. Caille, *Bauxite Mining Conflicts in Guinea: Causes Identification, Analysis, and Countermeasures*, “International Journal of Mineral Processing and Extractive Metallurgy” 2021, no. 6(3), pp. 53–66; D. Byerlee, X. Diao, C. Jackson, *Agriculture, rural development, and pro-poor growth. Country experiences in the post reform era*, “Agriculture and Rural Development Discussion Paper” no. 21, The World Bank, 2005; L. Cheshire, J.A. Everingham, G. Lawrence, *Governing the impacts of mining and the impacts of mining governance: Challenges for rural and regional local governments in Australia*, “Journal of Rural Studies” 2014, no. 36, pp. 330–339.

¹⁴ Mining activities pose a significant threat to agricultural productivity, particularly in rural areas where farming plays a crucial role in livelihoods and food security. The encroachment of mining operations onto agricultural lands can lead to the degradation and contamination of soil and water sources, resulting in adverse effects on agricultural productivity and crop yields. One of the primary concerns is the contamination of soil with heavy metals and chemicals used in mining operations. These pollutants can seep into the soil, affecting its fertility and nutrient composition. Heavy metals such as mercury, arsenic, and lead, which are commonly used in mining processes, can accumulate in the soil over time, posing health risks to plants and reducing their growth and productivity. See D. Byerlee, X. Diao, C. Jackson, *Agriculture...*

Guinea has become one of the world's largest rice importers, largely due to the impact of mining on water resources and land, and the priority given by governments to one economic activity at the expense of another.

Given the mode of appropriation of territories and the duration of the processes implemented, mining projects generally have a maximum lifespan of thirty years while peasant agriculture is based on the renewal of production according to the cycle of the seasons, and the local, national or foreign consumption determine two opposing logics, which take the form of two antagonistic models: that of extractive activity and that of peasant agriculture. This situation on land and water, increasingly tense and precarious, is the source of numerous conflicts. More generally, this situation highlights the question of the social function of land and the fact that the international division of labour also results in a transfer of the double environmental and social "burden" from the North to the South. Importing countries and transnational corporations force producing countries to take on the "negative externalities" – as economists define them – of these mining activities: environmental degradation, ecosystem imbalance, global warming, displacement of populations, loss of resources and livelihoods, worsening poverty and inequalities, economic dependence, breakdown of communities.¹⁵

The environmental impact of mining is particularly heavy. Open-air mega-projects are the most controversial, due to the volume of earth and rocks displaced, their intensive activities, the risks they incur and the damage they can cause. But, beyond these events that make the headlines, the problem refers to the "normal" environmental disaster produced by such exploitation. It is our unequal and exponential mode of consumption and production which is to blame. Although all peoples of the South are affected by extractive activity, they are not all affected in the same way and with the same intensity. Farmers, women and indigenous peoples are more exposed, due to their initial position of vulnerability and their direct interdependence with the land and the environment, monopolised or degraded by the mine. Thus, women are most generally in charge of activities related to water, food and care, and are

¹⁵ B. Campbell, M. Laforce, *La responsabilité sociale des entreprises dans le secteur minier, réponse aux enjeux de légitimité et de développement en Afrique*, Québec 2016; Banque Mondiale, *Guinea: strengthening public expenditure management for poverty reduction and growth – public expenditure review*, Report No 27347-GUI, Washington D.C. 2004; B. Campbell, *Revisiting the interconnection between research strategies and policy proposals: reflections from the artisanal and small-scale mining sector in Africa*, *Third World Thematics*, "A TWQ Journal" 2016, no. 1 (2), pp. 165–183; S. Kivinen, J. Kotilainen, T. Kumpula, *Mining conflicts in the European Union: Environmental and political perspectives*, "Fennia" 2020, vol. 198, no. 1–2, pp. 163–179.

therefore heavily affected by mining. Furthermore, as accessible spaces have been explored and exploited, the hunt for raw materials pushes the extractive frontiers ever further. However, it is increasingly the indigenous territories, often rich in minerals, which attract covetousness.

The assessment of the mining boom, the way to make the most of it and the question of its impact are therefore subject to debate and controversy, depending on the situation of people and countries within the world economy. As well as depending on their strategic vision of the phenomenon. If, overall, at the level of the Southern States, this is an opportunity to be seized to ensure growth and development, the unprecedented demand for resources also creates a climate of concern on a global scale, and finally arouses a massive rejection among various populations directly affected.

4. Agricultural activity in and around mining sites in Guinea: the example of the Boke Region

Subsistence agriculture is the pillar of Guinea's economy.¹⁶ The agrarian system of this country is characterised by the existence of village fields and bush fields. Village fields are located close to homes. They benefit from essentially organic inputs: crop residues, animal excrement and compost, and are protected against erosion. The bush fields are further from the villages. They provide the majority of production and are subject to mining-type exploitation; fallowing is the only form of reconstituting land fertility. The potential for cultivable land in Guinea is estimated at 6 million hectares, distributed in an unbalanced way between natural regions with densities of very different populations and low levels of productivity. The action of man leads to a reduction in animal and plant density, and soil degradation (erosion and decline fertility) leading to a reduction in agricultural productivity.

The climate of Guinea is characterised by the alternation of two seasons: a dry season and a rainy season. The duration of the rainy season varies

¹⁶ M. Bolay, *Artisanal Gold Miners Encountering Large-Scale Mining in Guinea: Expulsion, Tolerance and Interference*, in: T. Niederberger, T. Haller, H. Gambon, M. Kobi, I. Wenk (eds.), *The Open Cut: Mining, Transnational Corporations and Local Populations*, Zurich 2016, pp. 187–204; S.M. Banchirigah, G. Hilson, *De-agrarianization, re-agrarianization and local economic development: re-orienting livelihoods in African artisanal mining communities*, "Policy Science" 2010, no. 43, pp. 157–180; A.N. Bisoka, S. Geenen, A. Ansoms, J. Omasombo Tsonda (eds.), *Conjonctures congolaises 2016. Glissement politique, recul économique*, Paris – Tervur 2016, pp. 239–267; B. Campbell, P. Hatcher, *Neoliberal reform, contestation, and relations of power in mining: Observations from Guinea and Mongolia*, "The Extractive Industries and Society" 2019, no. 6, pp. 642–653.

depending on the natural regions (from 3 to 9 months). Rainfall varies on average from 3500 mm (coastal region) to 1300 mm (Upper Guinea); the rainfall peaks everywhere in July and August. The variations in rainfall often impose constraints on agriculture (early cessation of rains at the height of plant growth, delay of the rainy season, rains abundant and transient). In the most populated regions, soil fertility tends to degrade due to exploitation not being compensated by mineral contributions or a reduction in the duration of fallows or uncontrolled bushfires. The most serious situation is observed in Middle Guinea, followed by the coastal regions and forestry where we are witnessing a significant increase in cultivated areas. The high-society Guinea has significant land reserves but often of lower quality (low depth of soils and low water retention capacity). The analysis of the agricultural potential of the different regions of the country presents the main agricultural development options by natural region and, when possible, by homogeneous agro-ecological zone.

The demographic pressure experienced by the country has led to the reduction or even elimination of fallow land. The soils have then deteriorated. This resulted in a phenomenon of population migration towards areas with more fertile soil. Which is not without consequences, because it is a source of conflict, especially between farmers and breeders. The abusive exploitation of minerals in Guinea mainly in the Lower Guinea region is becoming a threat to waterways but also to exploitable lowlands.¹⁷ Watercourses are cut off and cultivated fields gradually become dry. This situation is becoming a worry for many farmers.

In the Boke region for example, an area that was once very fertile and very economical where several peasant women met to grow vegetables, they are saddened by the considerable damage done to their fields and they are

¹⁷ N.G. Tshiebue, *Le développement rural: réalités, enjeux et pistes d'actions*, in: idem, *Le développement rural en RD Congo. Quelles réalités possibles?* Louvain-la-Neuve 2016; P. Rey, *Une gouvernance locale à l'épreuve du temps. Politiques nationales, pouvoirs locaux et stratégies des miniers en Guinée*, "Vienna Journal of African Studies" 2016, no. 30, p. 103; T. Badibanga, *Agricultural development...*; P. Diallo, *Social insecurity, stability and the politics in West Africa: A case study of artisanal and small-scale diamond mining in Guinea, 1958–2008*, "The Extractive Industries and Society" 2017, no. 4, pp. 489–496; M. Diop, *Réformes foncières et gestion des ressources naturelles en Guinée: enjeux de patrimonialité et propriété dans le Timbi au Foula Djallon*, Paris 2007; *Protocole d'entente 2013 sur la réinstallation des populations affectées par le projet d'extension*, Essakane S.A., Essakane 2013, p. 198; J. Horsley, S. Prout, M. Tonts, S.H. Ali, *The Extractive Industries and Society Sustainable livelihoods and indicators for regional development in mining economies*, "Bio-chemical Pharmacology" 2015, no. 2, pp. 368–380.

categorical about the cause of the problem: “Since the arrival of the mining companies, we have noticed this lack of water in our lowlands. You can see, the land is dry, so we have to make wells and water our vegetables each time,” emphasises one of them. On the same wavelength, other vegetable producers talk about the impact of this mining on vegetable production, they specify that their vegetables no longer produce as much as in the past, they flower but many flowers quickly fall under the effect of pollution, they point out. In previous years, these vegetable farmers had staged a sit-in on the mining road denouncing mining as a source of damage and demanding compensation.

At the time, a water and forest environment mission went to observe the damage, more than reported by farmers. This situation was subsequently brought to the table by local authorities, who had tried, to no avail, to put an end to this problem. Mining can contaminate soil over large areas. Agricultural activities close to a mining project may be particularly affected. The profitability of agricultural activity, both in the nearby and distant areas, should push the authorities in contact with the populations and industrialists to review the estimate of financial compensation; this should be done not in relation to investments, but in relation to production losses over a specific period.¹⁸ It is also important to guide the evicted populations in the use of the money received during compensation. Their bad investments mean that they very often find themselves in precarious situations. Sustainable land management constitutes a global problem requiring the involvement of institutional actors, partners and populations in the implementation of strategies. Positive consequences for those who engage in agricultural activity is that Boke offers a profitable market for the consumption of agricultural products, the sales cycle being very short.

As a sector with significant comparative advantages in its embryonic stage, modern agriculture stimulates exports, and in turn, contributes to the growth of the country’s foreign exchange earnings. It is by having a direct impact on improving rural income and ensuring the provision of low-cost food – both in rural and urban areas – the creation of new opportunities in the non-agricultural sector and the stimulation. With the emergence of the manufacturing sector, agriculture presents itself as an important contributor to poverty reduction. In addition to its contribution to food security, agriculture

¹⁸ N.G. Tshiebue, *Le développement rural...*; P. Rey, *Une gouvernance locale...*, p. 103; A.S. Worlanyo, L. Jiangfeng, *Evaluating the environmental and economic impact of mining for post-mined land restoration and land-use: A review*, “Journal of Environmental Management” 2021, vol. 279, 111623.

can also provide positive environmental services such as protecting biodiversity and sequestering carbon. Sensitive to these merits and attracted by the success of the sector in certain Asian countries, donors and international institutions have increased programmes to promote agriculture in developing countries.¹⁹ However, these programs often do not achieve their objectives because the majority of the population in developing countries who depend solely on agriculture for their survival are relatively poor compared to populations earning their income from other sectors of the economy.

Mining provides a substantial contribution to the socioeconomic development of Guinea.²⁰ But it also has negative impacts on the environment and the livelihoods of local communities in the surroundings of the companies. The situation is relevant for communities in the region of Boke. The mining sector contributes to the degradation of natural resources (land, water and vegetation) which are the foundation for agricultural productions on which live those communities, therefore compromising their livelihoods.

In this study, many households in the provinces of Boke were surveyed on those subjects. The research shows that most of the surveyed people living in the industrial mining zone of Boke, looking at the past years following the establishment of the company, believe that their living conditions have degraded. This degradation of living conditions in the surrounding of the industrial mining, especially in Sangaredi, Kolabouni and Kamsar (in the Region of Boke), is due to the fact that the companies take possession of properties without suitable compensations for their original owners. It is therefore urgent to put in place a specific regulatory framework which will take into account all living resources of local people and guide mining companies with thoroughly sound compensation rules for communities in mining areas. The adoption of the Mining Vision for Africa (AMV) in 2009

¹⁹ D. Byerlee, A. De Janvry, E. Sadoulet, *Agriculture for development: toward a new paradigm*, "Annual Review of Resources Economics" 2009, no. 1, pp. 15–31; D. Byerlee, X. Diao, C. Jackson, *Agriculture, rural development...*; L.A. Johnston, *Steel pipe dreams: A China-Guinea and China-Africa lens on prospects for Simandou's iron ore*, "The Extractive Industries and Society" 2017, no. 4, pp. 278–289; S. Spiegel, S. Hoeng, *Artisanal and Small-Scale Mining (ASM): policy options for Cambodians*, Phnom Penh 2011.

²⁰ S. Souare, *Bauxite Mining in the Boké Region (Western Guinea): Method Used and Impacts on Physical Environment*, "European Journal of Sustainable Development Research" 2019, no. 3 (3), em0087; M.S. Diallo, *Pratiques des industries extractives en Afrique de l'ouest, synthèse comparative de quatre études de cas (Sénégal, Guinée Bissau, Guinée et Sierra Leone)*, Glande – Dakar, Conacry – Freetown 2010, p. 35; L. Diallo, *Industrie minière...*; M.C. Diallo, A. Tali, L. Traoré, *Les enjeux de la gouvernance...*; P. Diallo, *Social insecurity, stability...*

by the African Union and the process of revising mining codes initiated by most African countries suggest major changes in the orientations of national public policies.²¹ The AMV takes a holistic approach, integrating mining into national policies and ensuring that mining contributes to sustainable development.²²

Perhaps in part because of its contribution to employment and to the informal economy, the environmental impact of mining remains a major challenge, which is yet to be adequately addressed in most African countries.²³ Although most African countries have environmental legislation, this is often not enforced. In countries such as Guinea, mining has posed real development and environmental challenges. Agricultural lands are used as mining sites and once mining is finished, there is no effort to make the land viable for agriculture once again. Capacity-building ideas could include assisting governments to design and implement viable, environmentally sensitive mining policies.²⁴

Conclusion

This study sought to assess the economic and social impact of the development of the mining sector to the detriment of agriculture in Boke-Guinea. The research results presented in this paper confirm the adopted research hypotheses. From this analysis, four main conclusions emerge: the mining sector has a significant weight in exports, in the formation of GDP and contributes to the socio-economic development of the country, compared to agriculture and those of other sectors of the economy however, this contribution turns out to be relatively limited.

Moreover, the country seems to have generally benefited less from its mining resources despite increasingly growing output of the mining sector. In terms of economic policies, the study highlights the need to put mining resources more at the service of the agricultural sector for the sustainable

²¹ Guinea was appointed as host of the headquarters of the African Minerals Development Centre by member states of the African Union, a body dedicated to harnessing the continent's mineral wealth for the betterment of all African nations.

²² UNECA, The United Nations Economic Commission for Africa, *Minerals Centre produces Guidebook for Domestication of African Mining Vision*, Addis Ababa 2014.

²³ M. Voss, E. Greenspan, *Community Consent Index: Oil, Gas and Mining Company Public Positions on Free, Prior, and Informed Consent (FPIC)*, Boston – Washington D.C. 2012, p. 7.

²⁴ P. Diallo, *The Africa Mining Vision: A Panacea to the challenges of the African mining sector or another mirage?* "Leadership and Developing Societies" 2016, vol. 1 (1).

and socio-economic development of the country. In order to complement the existing studies on agriculture as an alternative activity to mining, it is imperative to seek to understand the organisation of agriculture in the mining areas of the country, as well as the constraints it faces which would delay its development and prevent it from being a good real “alternative,” to analyse the perception that the populations have of it.

The data collected using qualitative methods demonstrate that agriculture in mining areas is organised according to a structure and well-defined stages, ranging from the acquisition of the land to be exploited to the production and marketing process. At each stage, farmers face different constraints that prevent them from producing more and increasing their income.

First, land insecurity contributes significantly to the low yield of small farmers in developing countries in general. Farmers in Guinea and especially those in Boke are not spared. Indeed, lacking sufficient land to meet the needs of their household, they are forced to sign land rental contracts with large landowners. However, due to their weak financial capacity and the nature and content of these contracts, they find themselves confined to a situation of underproduction with, as a corollary, low income.

Then, as in all rural areas of the Republic of Guinea, they must endure in the production process technical constraints such as lack of tools, diseases affecting the plantations and unsuitable cultivation techniques. In addition to technical obstacles, there are institutional constraints, since public institutions are relieved of almost all forms of support. Furthermore, the process of marketing production also proves to be tedious: not being able to benefit from road and conservation infrastructures and having to endure harassment while having to pay multiple taxes, farmers are forced to sell their harvest at a ridiculous price. Interviews conducted with the main stakeholders reveal that mining constitutes a major handicap for agricultural development. Given that the majority of inhabitants practice agriculture with members of their family, this situation remains a real threat to survival.

Finally, as the second activity practised in rural areas after mining, agriculture would be the first choice in the absence of mining. The low income generated by this activity compared to mining and the fact that it occupies the second place in terms of importance could, however, dissuade some, who would more readily turn to mining. Several analysts argue that agriculture would be a good “alternative” to mining in the Boke territory if efforts were made to support those who practice it. We believe that proper implementation of the law establishing fundamental principles relating to agriculture in Guinea would be the way to achieve this, because it already offers solutions

to the problems facing the country's farmers. In its relevant provisions, this law advocates equitable access to land and the establishment of an agricultural land register in order to ensure the proper administration of land intended for agricultural exploitation. As part of the implementation of the law, decision-makers can carry out agrarian reform in the areas concerned with a view to redistributing large concessions to small farmers and thus avoiding problems linked to agricultural contracts. In addition, other conservation infrastructures would allow farmers to better preserve their production, while the supervision of public agents, and more particularly the agronomist monitor, would encourage farmers to update their farming techniques.

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