PASAS

PLATEFORME D'ANALYSE, DE SUIVI ET D'APPRENTISSAGE AU SAHEL

PORTÉ PAR

MINKA | AFD AGENCE FRANÇAISE DE DÉVELOPPEMENT

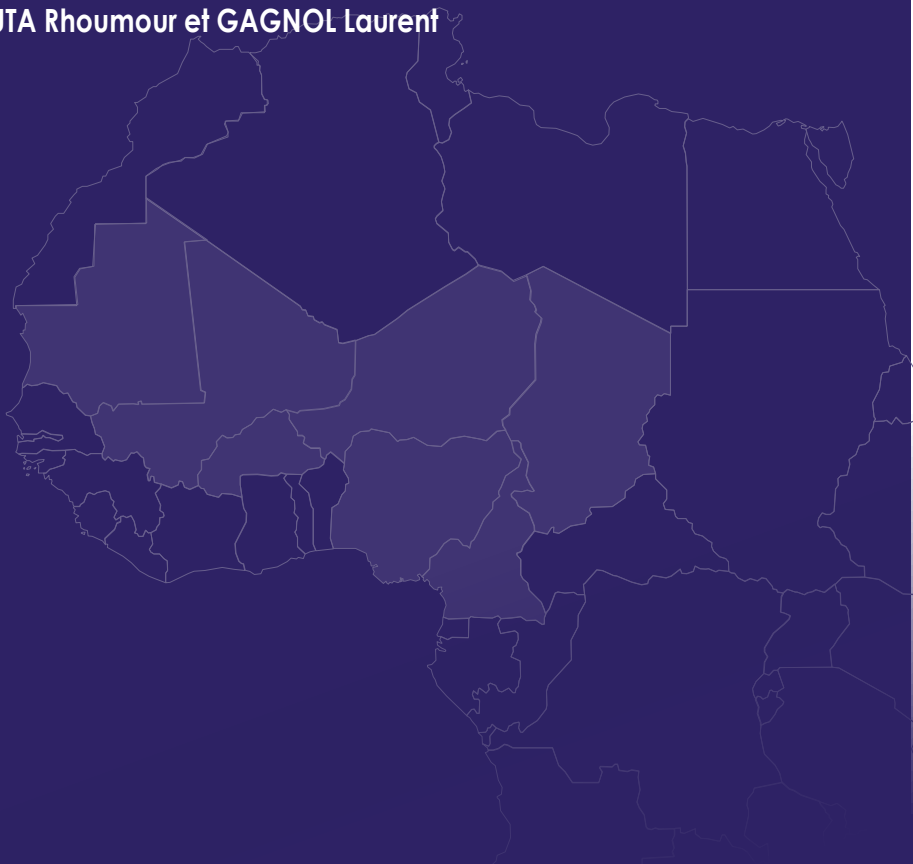
Capitalisation on Artisanal Gold Mining in the (Former) G5 Sahel Countries and Senegal

Analytical Overview

15 mars 2024

Public

AHMET TCHILOUTA Rhoumour et GAGNOL Laurent



IRD Institut de Recherche pour le Développement FRANCE | ICE FRANCE | UK International Development Partnership | Progress | Prosperity | ALLIANCE SAHEL

Please quote this publication as follows:

AHMET TCHILOUTA R. et GAGNOL L. (March 15, 2024), Capitalisation on Artisanal Gold Min- ing in the (Former) G5 Sahel Countries and Senegal – Analytical Overview, Plateforme d'Analyse du Suivi et d'Apprentissage au Sahel, Production Pasas.

https://pasas-minka.fr

Burkina Faso, Mali, Mauritania, Niger, Chad, Senegal

Artisanal and Small-Scale Gold Mining; Socio-Economic Development; Value Chain; Gov-ernance; Formalisation; Environment; Public Health; Security

CONTENTS

ACRONYMS AND ABREVIATIONS

ANEEMAS	Agence Nationale d'Encadrement des Exploitations Minières Artisanales et Semi - mécanisés (National Agency for Artisanal and Semi-Mechanized Mining)
ASGM	Artisanal and Small-scale Gold Mining
INSD	Institut National de la Statistique et de la démographie (National Institute of Statistics and Demography)
NSAGs	Non-State Armed Groups
OECD	Organisation for Economic Cooperation and Development
SONASP	Société Nationale des Substances Précieuses (National Society for Precious Substances)
SONEMIC	Société nationale d'exploitation minière et de contrôle (National Mining and Control Company)
SOPAMIN	Société du patrimoine des mines du Niger (Niger Mines Heritage Society)
UAE	United Arab Emirates (UAE)
UNECA	United Nations Economic Commission for Africa
UNODC	United Nations Office on Drugs and Crime

EXECUTIVE SUMMARY

This analytical brief delves into the complex dynamics of artisanal and semi-industrial gold min- ing in the countries of the former G5 Sahel (Mauritania, Mali, Burkina Faso, Niger, and Chad) and Senegal, with a focus on the Liptako-Gourma region, known as the "three borders" (Burkina Faso, Mali, and Niger). This is based on a study conducted for PASAS: " ***Étude sur la capitalisation de l'orpaillage artisanal dans les pays du G5 Sahel et au Sénégal" (Le-clerc-Olive, Ouedraogo, Traoré, & Mégret, 2023)***. Covering the period 2012–2023, this study analyses the potential of artisanal gold mining for socio-economic development and the opportunities it presents for the populations of this area. It examines national and regional regulatory frameworks and their effectiveness in governing practises and value chains in artisanal gold mining. Moreover, the brief addresses the challenges and threats related to its regulation, notably the involvement of armed groups, including terrorists, in a region facing major politico-institutional uncertainties and increasing security instability. Finally, it assesses the environmental and health impacts of the sector.

The contemporary geo-historical development of artisanal gold mining shows a fluctuating tra- jectory, with an intensification of activity in the early 1980s, linked to the rise in the global price of gold and the recurrence of droughts in the Sahel. After a relative decline, there has been a spectacular development of the sector in the end of the first decade of the 2000s. By offering employment opportunities and contributing to local economies, it allows for the relative stabi- lisation of gold-bearing regions and plays a socio-economic role that has become par-amount today for these countries marked by significant political turbulence. Nonetheless, research re- veals connexions between this activity and armed groups: certain areas are under their direct or indirect control, affecting the security and practices of gold miners, although there is no causal link between the presence of jihadists and that of gold. The activity also poses significant environmental and socio-health risks due to the lack of respect and control regarding existing regulations and the increasing use of highly toxic products whose sale is nevertheless prohib- ited.

Rather than a repressive approach or, conversely, laissez-faire, the analysis highlights the need for more concerted and sustained governance and regulation to mitigate negative effects and leverage this indispensable sector. It advocates for concerted efforts among Sahel coun- tries, regional organisations, and international actors to address the challenges posed by gold mining, in order to make it a lever for sustainable socio-economic development and a factor of peace.

INTRODUCTION

This briefing explores the complex dynamics of artisanal and small-scale gold mining (ASGM) in the countries of the former G5 Sahel (Mauritania, Mali, Burkina Faso, Niger, and Chad) and Senegal. The study spans from 2012 to 2023, a period marked by significant politico-institutional uncertainties and increasing instability. Particular attention is paid to the Liptako-Gourma re- gion, or the so-called three-border area (Burkina Faso, Mali, and Niger), which concentrates security threats. This analysis is based on documentation produced over this period and in this vast geographic area to explore potential links between artisanal gold mining and armed groups, including terrorists. Furthermore, this synthesis examines the regulatory frameworks at national and regional levels and their effectiveness in regulating mining practices and value chains. It also looks at the socio-environmental impacts of this sector, particularly in terms of environmental degradation and public health, as well as its socio-economic effects.

This briefing aims to provide nuanced and extensive insights into the role of artisanal gold min- ing in socio-economic development, environmental sustainability, and the security risks associ- ated with this activity. It also seeks to identify relevant recommendations and research avenues to inform the environmental, health, regulatory, and security policies of these countries. It relies on a methodological approach that combines documentary research and a systematic re- view of the literature produced on artisanal gold mining in the G5 Sahel countries and Senegal. A total of 117 bibliographic references were collected and analysed, including academic ar- ticles and study reports, covering the period 2012-2023. This approach includes a comparative dimension to highlight the diversity of effects of this activity in different regional contexts, de- spite the inherent limitations of this analysis, particularly the challenges of studying clandestine activities and the fragmented nature of available data.

Finally, it is important to note that this briefing does not solely rely on the initial report, "***Étude sur la capitalisation de l'orpaillage artisanal dans les pays du G5 Sahel et au Sénégal***" ***(Leclerc- Olive, Ouedraogo, Traoré, & Mégret, 2023***), but more broadly on the literature it mobilises. It is a revised and expanded synthesis incorporating elements and perspectives not covered (or insufficiently so) in the report it aims to synthesise.

1 - GOLD MINING IN SAHEL AND SAHARA: HISTORICAL TRAJECTORIES AND CONTEMPORARY DYNAMICS

Gold mining in the countries of the former G5 Sahel and Senegal exhibits two distinct geo- historical trajectories: an intensification and transformation of ancient artisanal gold mining practices in the southern regions of the Sahel (notably Mali, Senegal, Burkina Faso) on one hand, and the more recent spread of this extractive practice, previously non-existent, in the Saharan regions (Chad, Niger, Mali, and Mauritania) on the other. The distinct geographic frames in which these dynamics occur do not preclude interactions and exchanges between them.

1.1 - Historical depth and contemporary dynamics of artisanal gold mining in the southern Sahelian region

Artisanal gold mining in West Africa dates back to the Middle Ages: the Bambouk and Bouré regions (in Senegal, Mali, and Guinea) have been known for their mining deposits at least since the 10th century, as have the Lobi country in Burkina Faso and the Sirba valley in Niger (Kié- théga, 1983; Devisse, 1993; Bantenga, 1995; Mbodj, 2009). By the late 1970s and early 1980s, with the rise in gold prices on international markets and the recurrence of droughts in the Sahel, artisanal gold mining became a widespread refuge activity among the most vulnerable pop- ulations (Seidou, 2013; Doucouré, 2014; Lanzano & Arnaldi di Balme, 2017). Traditional forms of artisanal gold exploitation were then reactivated, intensified, and extended to new regions such as the Liptako in Burkina Faso in 1973 and the Liptako in Niger in 1984 (Carbonnel, 1991; Abass Saley, et al., 2021). After a period of relative decline, a new cycle of reinvigoration of gold mining strengthened from the mid-first decade of the 2000s. The development of ore treatment techniques through cyanidation has ensured the intensification and spatial exten- sion of artisanal gold mining activities, allowing the extraction of gold from increasingly low- grade sites, as well as the reactivation of old sites for the reprocessing of residues (Sawadogo, 2021; Verbrugge, Lanzano, & Libassi, 2021).

Artisanal gold mining in the Sahelian regions has its unique characteristics. The activity is partly seasonal, with the rainy season making underground gold exploitation difficult and dangerous. It usually complements other seasonal activities (agriculture and livestock) with which it may conflict. While the activity generates significant population flows due to its attractiveness, it relies on local appropriation by village communities and family structures (involving women and children). In most cases, it is regulated by customary law and local institutions, which inter- vene in disputes (Carbonnel, 1991; Arnaldi di Balme & Lanzano, 2014).

Finally, its historical anchorage has facilitated the first geological prospecting by mining com- panies and the estimation of the profitability of gold deposits. The Sahelian regions have thus offered a favourable framework for the development of industrial exploitation.

1.2 - Recent Emergence of Gold Extractivism in the Saharan Region

Although industrial gold mining projects have been undertaken in the Sahara — Hassai in Sudan since 1992; Tirek (in 2001-2007) and Amesmessa (since 2005) in Algeria; and particularly Tasiast in Mauritania starting from 2010 —, artisanal gold mining was non-existent until the 2010s. The introduction of metal detectors and the liberalisation of the market in Sudan as early as 2009 opened the Saharan regions to a wide front of prospecting that gradually spread from East to West. From the Nubian desert in 2009, to Darfur (Sudan) in 2012, Tibesti (Chad and Libya) in 2013,the north of Niger in 2014 (spilling over into Algeria), Mauritania in 2016 and Western Sahara in 2017, the Sahara was covered across its entire latitudinal extent by a veritable gold rush (Chevrillon-Guibert, Gagnol, & Magrin, 2019; Gagnol & Ahmet Tchilouta, 2021).

The scarcity of water points in the Saharan regions gives gold mining specific characteristics (Afane & Gagnol, 2020). The ore, once extracted, is transported over long distances to dedicated centres, where water is accessible. Ore processing involves crushing and grinding, followed by amalgamation with mercury and/or treatment with acid and cyanide solutions. The banning and expulsion of gold miners from certain sites by authorities cause them to move to other locations, accelerating the rush (Gagnol, Ahmet Tchilouta, & Afane, 2022). The nomadic Saharan populations have been able to maintain their pre-eminence in the organisation and marketing of gold, keeping control and mastery of logistics (Gagnol & Ahmet Tchilouta, 2021). Migrant workers from the Sahel mainly perform the physically demanding and dangerous tasks (extraction and processing of the ore). Moreover, it is an exclusively male activity, with women and children being forbidden from gold mining sites (Grégoire & Gagnol, 2017; Fereday, 2023).

Although the Sahelian and Saharan regions each have their peculiarities, there are numerous connections, especially through the transnational mobility of populations and the emergence of specialised gold mining communities (from Burkina Faso, Mali, Sudan, etc.). These allow the diffusion in both regions of locally tested techniques and the logistic circuits they rely on (metal detectors, chemicals, and processing equipment, etc.) (Lanzano & Arnaldi di Balme, 2017; Gagnol & Ahmet Tchilouta, 2021).

2 - ANALYSIS OF PRODUCTION AND VALUE CHAIN AND THE GOVERN- ANCE CHALLENGES OF GOLD

Artisanal and small-scale gold mining (ASGM) in the Saharo-Sahelian regions is undergoing significant transformation, shifting from informal practices to semi-industrial operations in order to better integrate into global markets and maximise profits. The growth of this sector underscores its economic importance and potential for local development, although it still faces challenges in terms of formalisation and combating illegal practices. Efforts by states to regulate and formalise this sector through legislative reforms and improved governance aim to mitigate these threats.

2.1 - Gold Extraction Methods: Diversity of Processes and Adaptation to Geological Conditions

There is a diversity in the types of gold deposits, which vary according to geological genesis and geomorphological processes. In primary deposits, gold (native) is found in rock formations, notably quartz veins that outcrop and go deep along faults, and in more massive formations of metamorphosed host rocks containing finer gold granules, but whose grades can be high. Erosion leads to the creation of secondary deposits, either by the decomposition of the ore (eluvial deposits) or by deposition and concentration in watercourses (alluvial deposits or placers).

Gold prospecting typically reverses the genesis process of gold deposits, starting with the discovery of alluvial (secondary) gold, to then search for the primary source. The geographical context significantly influences the methods of extracting ore from secondary deposits. In the Sahelian regions, alluvial gold is extracted from watercourses using its weight through simple gravity techniques: in its most artisanal form, panning or the use of a sluice box isolates the gold; in its mechanised form, dredges are used to remove sediments from watercourses and deposit the gold on the mats of washing sluices. In the Saharan regions, alluvial gold from dried riverbeds is sought with metal detectors and extracted using picks in its most artisanal form, or mechanised by collecting auriferous sand with loaders and processing it in sorters that use gravity and wind to isolate the gold.

The methods of extracting gold from primary deposits are similar throughout the Saharo-Sahelian region, requiring mining shafts to follow the vein deep into roughly equipped galleries. Only

the ore processing methods may vary to meet the varying constraints of access to water resources.

2.2 - From Clandestine Operation to Development of the Semi-Industrial Sector

The production and value chain of artisanal gold mining encompasses a set of activities that contribute to its commercial purpose: prospecting, extraction, processing, marketing, refining, and its valorisation on the international market. Semi-industrialisation transforms this sector and tends to complicate the supply chain, allowing for the reprocessing of mining residues. Finally, while artisanal gold mining was characterised by informality or even illegality from the perspective of central authorities (unable to control it), today they seek to formalise it, which reinforces hierarchies among actors at different stages of the chain by pushing certain activities that remain clandestine into illegality (Gagnol, Ahmet Tchilouta, & Afane, 2022).

In the Saharan regions, small mobile units consisting of metal detector operators, diggers, drivers, and vehicle owners carry out prospecting activities. Extraction also involves a variety of actors (site managers, well or gallery owners, head of extraction, diggers, jackhammer operators, service providers such as motor pump operators, the "caleurs" or gallery support specialists, and "tapeurs" or blasting experts, etc.). The treatment of ore and mining waste also mobilises a multitude of actors, depending on the techniques used: owners of crushers, grinders or tanks (wheel mills), specialists in mercury amalgamation or cyanidation, etc. Moreover, these activities generate numerous direct and indirect jobs, such as transportation (goods and people), conveyancing, commerce, site provisioning, local crafts, etc.

Contrary to purely productive activities, final marketing activities are less well documented, partly due to multiple risks that make actors cautious, but also due to illegal and corrupt practices in the sector. The structure of the official networks that control the gold trade is pyramidal. At the top are licensed wholesale exporters. These wholesalers are supplied by small traders operating in various localities, at different levels of the production chain. Their objectives are to maximise the value of their gold by limiting the number of intermediaries, assuming the risks and security of gold transportation, and selling as close as possible to the top of the pyramid (Grégoire & Gagnol, 2017).

The diversity of activities structuring the artisanal exploitation of gold and ensuring its valorisation illustrates its rooting in the economies of the Saharo-Sahelian states in connection with integration into international markets.

2.3 - Increasing Economic Weight for National Economies

Although there are no reliable statistics that can be used to accurately and exhaustively quantify the AGSM, all available sources highlight its central and growing economic significance. However, beyond its scale, the internal dynamics confer a strategic role for states. Indeed, the gradual complexification of its activities and the almost inevitable evolution towards semi-industrial forms of exploitation are leading to the emergence of local entrepreneurial elites capable of advancing the sector towards the mining of less accessible minerals (Sawadogo & Da, 2021; Lanzano & Arnaldi di Balme, 2021). Thus, rather than conflicting with the development of national extractive industries, the artisanal sector could serve as a lever or at least a complement, rather than a rival.

However, the contribution of the artisanal gold mining to the socio-economic development of the concerned states also depends on its integration into systems of tax collection and redistri- bution, to ensure equitable access to its benefits. Yet, even partial statistics reveal the existence of numerous marketing circuits that escape national licenses and legislation. Drawing on other analyses, a report by the United Nations Office on Drugs and Crime (UNODC) shows significant disparities between the gold ex- ports declared by Sahel coun- tries and the imports declared

a report by the United Nations Office on Drugs and Crime (UNODC) shows significant disparities between the gold ex- ports declared by Sahel coun- tries and the imports declared by the United Arab Emirates (UAE)

from these countries. For exam-

ple, in 2019, Mali declared it had exported 0.567 tonnes of gold to the UAE, while the latter declared it had imported over 80 tonnes. Similarly, in 2021, Niger

and Chad declared gold exports

of 2.5 tonnes and 0 tonnes, re- spectively, while the UAE de- clared importing over 34 and 13 tonnes from these countries (UNODC, 2023). These discrepan- cies, indicative of the existence of international smuggling net- works, are regularly highlighted

by seizures made internationally:

241 kg of gold in 2019 in Khar- toum; 1400 kg in 2023 in Addis Ababa coming from Niger and transiting to the United Arab Emir- ates (VOA, 2024).

Faced with the challenges posed by the illegal marketing of gold, which cannot occur without the

corruption of their own institu-

tions, the Saharo-Sahelian states have embarked on a process of formalizing artisanal gold mining. This process aims to integrate this activity within a regulatory framework, ensuring it

contrib- utes positively to the economic development of countries and the well-being of populations, while reducing illegal activities and their negative impacts.

BOX 1: ARTISANAL GOLD MINING: A PHENOMENON DIFFICULT TO QUANTIFY

According to a report by the OECD (2018), 10% of the working population in Mali, Burkina Faso, and Niger lives directly or indirectly from this activity. According to the Nigerien Ministry of Mines, there are over 200 artisanal gold mining sites in the country, distributed across the regions of Agadez, Tillabéri, and, more recently, Maradi. From a seasonal subsistence activity, artisanal gold mining has become a key industry, employing more than 800,000 people.

In Burkina Faso, the l'Institut National de la Statistique et de la démographie (National Institute of Statistics and Demography) (INSD) recorded 448 sites in 2017, while estimates by Agence Nationale d'Encadrement des Exploitations Minières Artisanales et Semi - mécanisés (National Agency for Artisanal and Semi-Mechanized Mining) (ANEEMAS) vary between 500 and 1,500 in 2017 and 2018 (Effigis, 2018). According to the Ministry of the Environment, in 2020, this sector employed 427,785 people in the country. Since the adoption of the mining code of 2012, the Malian government has granted 1,421 exploration licenses (Bolay, 2022). According to the action plan for artisanal and small-scale gold mining in Mali, the industry employs more than 512,000 people. However, according to the Chamber of Mines of Mali in 2022, it would employ about one million people distributed over 369 sites; 188 authorized gold buying and exporting counters; and 100 functional cooperatives (ITIE Mali, 2022). These figures do not indude sites located in the north of the country.

In Chad, 116 gold sites were identified in 2020 in the central and northern regions. From a study covering 61 mining sites in 2020, the Chadian government estimated that there would be at least 63,772 artisanal miners in the country. The United Nations Economic Commission for Africa (UNECA) estimates that there would be more than 300,000, particularly concentrated in Tibesti. In Mauritania, according to Maaden, a national industrial and commercial agency founded in 2020, artisanal gold mining would have created more than 52,000 direct jobs and 220,000 indirect jobs (Gagnol & Ahmet Tchilouta, 2021).

2.4 - ADDRESSING THE CHALLENGES OF GOLD RUSHES: STATE RESPONSES AND THE PURSUIT OF REGULATED ARTISANAL GOLD MINING

In face of challenges posed by successive gold rushes and risks to public order, states often resort to repression and the clearance of newly established sites. The resilience of artisanal forms, pushed into illegality and informality, has prompted states to initiate efforts aimed at formalizing and regulating them more effectively (Bolay, 2022; Gagnol, Ahmet Tchilouta, & Afane, 2022; Sawadogo & Da, 2021). These efforts unfold at the national level down to the most remote areas, in the form of legislative reforms, changes in regulatory institutions, and the establishment of bodies charged with closely supporting and overseeing gold prospectors.

Mining codes have been revised to recognize artisanal gold mining, thus creating a legal framework. Mining permits are issued based on the type of activity (mining, processing of residues, etc.) and the scale of operations (artisanal, semi-mechanized, or industrial). Designated perimeters where mining can legally occur are delineated and registered in mining cadastres. New legal frameworks allow states to govern artisanal gold mining by opening new perimeters to compensate for the closure of old ones, imposing seasonal bans (during the rainy season in Sahelian regions), and regulating or prohibiting high-risk activities (transport of explosives).

For these legislative reforms to be effective, states are working toward the modernization, coordination, and enhancement of the transparency of the institutions responsible for the sector (Ministries of Mines, cadastre services, geological services, financial regulation institutions, etc.), in accordance with international standards (ITIE transparency standards, OECD due diligence). Efforts to make decisions public and strengthen cooperation with gold prospector groups, traditional authorities, and local communities are being redoubled. Moreover, states are increasingly delegating the management of mining activities to public– private joint ventures (SOPAMIN in Niger, ANEEMAS, then SONASP in Burkina Faso, MAADEN in Mauritania, SONEMIC in Chad), thus allowing for increased surveillance and control on the ground. These enterprises have various responsibilities, including issuing activity permits, training, enforcing legislation, overseeing processing centres, and establishing gold purchase counters.

However, these efforts encounter numerous difficulties. Delegation to public– private enterprises complicates the institutional framework by increasing the number of actors and levels of decision-making, making democratic control difficult (Sawadogo & Da, 2021). The decision-making process continues to face challenges from the multitude of local authorities controlling mining (Megret, 2023; Sawadogo & Da, 2021). In the Sahelian regions, the importance of customary law in conflict management has led to the emergence of local forms of authority, such as vigilance committees in the Torodi department in Niger (Crisis Group, 2019) and Tomboloma (mine police and justice) in Mali (Lanzano & Arnaldi di Balme, 2017). More broadly, across the Saharo-Sahelian region, the integrity of decisions made by state authorities is undermined by their involvement in clientelist networks with local politico-economic elites (Megret, 2013;

Gagnol & Ahmet Tchilouta, 2021). Furthermore, formalization, even though it aims to evolve traditional practices toward the semi-industrial, struggles to address the systemic marginalization of the most impoverished forms of artisanal mining (Sawadogo & Da, 2021).

3 - SOCIO-ECONOMIC, ENVIRONMENTAL, AND SECURITY CHALLENGES OF ARTISANAL MINING

Despite its potential for economic development and the job prospects, it offers to local populations, its exploitation without appropriate oversight leads to serious socio-economic and environmental problems that compromise the development and ecological balance of these regions. Moreover, these unregulated mining practices not only hinder the growth of the sector but also affect the development of society through a series of negative impacts on social, environmental, and security fronts.

3.1 - Social and Urban Repercussions

Artisanal gold mining generates socio-spatial inequalities. It triggers intranational and international migration, with people moving in search of jobs at mining sites. Sometimes, these relocations are financed by debts, making some miners more dependent and vulnerable to forms of exploitation that may exist on gold mining sites (Fereday, 2023). The unpredictability of earnings from mining activities can lead to situations of distress and wandering. In June 2022, the eviction of miners from the Kouri Bougoudi site by Chadian authorities left about 10,000 miners in a state of severe health precariousness.

Women and children, in particular, are the most exposed. While women are excluded from direct participation in artisanal gold mining in the Saharan regions (Afane & Gagnol, 2020; Fereday, 2023), in the Sahelian regions, they struggle to access significant roles in the sector's hierarchy and remain victims of numerous gender-based discrimination (Arnaldi di Balme & Lanzano, 2014; Ouédraogo, 2020). Children working on these sites not only endure working conditions that violate both labor law and children's rights but are also victims of being out of school (GRDR, 2014; Manzo Diallo, 2020). Moreover, population movements related to mining have profound repercussions on urbanization. Mining towns emerge spontaneously around sites, exerting demographic pressure on pre-existing neighboring cities (Gagnol & Afane, 2019; Megret, 2023). These are faced with typical challenges of uncontrolled urbanization: saturation and degradation of infrastructure, sanitation problems, and development of illegal activities, illustrating the complexity of managing such rapid urban expansion.

3.2 - Gold Extraction: A Devastating Activity for Ecosystems and Public Health

Artisanal gold mining is particularly harmful to the environment and public health. The most visible impact is the transformation of the landscape (Dessertine, et al., 2022). The need to clear

land to dig wells and the demand for firewood and support for mines leads to significant deforestation, especially in the Sahelian regions. This deforestation directly affects the health of soils, making them vulnerable to erosion (Maiga, Touré, Ouattara, & Doumbia, 2022). Wells and shafts dug by miners pose significant risks of subsidence. Moreover, anarchic mining practices lead to the abandonment of open pits and shafts, creating deadly traps for wildlife and livestock, and endangering already vulnerable ecosystems. The widespread lack of rehabilitation of mining sites is a major issue.

Chemical contamination of ecosystems, though less visible, has been documented by various studies (Abdou Amadou, 2020; Keita, 2001; Bamba, Souleymane, Sako, Kagambega, & Miningoui, 2015). The use of mercury, cyanide, and the release of heavy metals such as arsenic by artisanal mines contaminate the entire biosphere, affecting both the communities of gold

BOX 2: CASE STUDY OF BURKINA FASO

A study conducted in the Cascades and Central-East regions of Burkina Faso has revealed alarming results linking the use of toxic products, notably mercury and cyanide, to the dedine of vegetation. Sediments collected in several regions showed high levels of mercury, indicating the massive infiltration of chemicals into the soil, leading to environmental contamination.

In Burkina Faso as well, a study carried out in the municipality of Kampti between 2001 and 2018 demonstrated significant degradation of the shrub savannah and an increase in bare soils. From an area of 43,128 hectares in 2001, the shrub savannah occupied only 24,652 hectares by 2018, representing a loss of nearly 60% (Sawadogo, 2021). However, this deterioration is attributed equally to artisanal gold mining (wood cutting, soil overturning), the increase in agricultural lands, and the growing needs of the population for firewood (Sawadogo & Da, 2021).

prospectors directly and those indi- rectly exposed through other activ- ities such as agriculture, livestock farming, and fishing (Roamba, 2014; Sawadogo, 2021; Sawadogo & Da, 2021; Maiga, Touré, Ouat- tara, & Doumbia, 2022). Water- courses and the entire under- ground aquifer network are ex- posed to long-term pollution, thus posing significant risks to public health (Maman Illatou, 2021; Ndiaye, 2020).

These environmental impacts often lead to conflicts over land use among village communities, farm- ers, herders, and gold prospectors. The prevailing informality, lack of regulation of this activity, and coor- dination with authorities responsible for environmental protection un- dermine efforts in terms of justice,

accountability, penalization of polluters, and rehabilitation of sites. As a result, the damage appears to be irreversible and long lasting (Bouramanding, Carrasse, & Sissoko, 2023).

3.3 - Security Challenges and Threat Spectrum of Non-State Armed Groups (NSAGs)

The emergence of artisanal gold mining in the form of sudden and massive rushes, outside any form of land ownership, and the resulting environmental degradation, is systematically linked to breaches of public order. This association justifies its regulation, often repressive, by law enforcement agencies. All conflicts of use that accompany the expansion of this activity highlight the need for management measures. Moreover, the inability of the State and customary authorities to administer justice effectively can lead to violent and armed confrontations between miners. However, these security considerations are very often overshadowed by the disproportionate attention given to the potential interactions between this activity and the development of Non-State Armed Groups (NSAGs), especially terrorists. It is important to clarify that many of these groups pre-existed the appearance of mining activities.

Although the available evidence is primarily indirect due to the difficulty of accessing the sites in question for an independent observer (Lanzano, Luning, & Ouédraogo, 2021; Gagnol & Ahmet Tchilouta, 2021; Bolay, 2022), the interactions between gold mining and NSAGs represent a threat that seems real in certain regions (notably in Liptako-Gourma, in the region north of Kidal) and include security services for the transport of gold, a substitute judicial authority for dispute resolution, and a fiscal author- ity in the absence of the State. In these lo- calized conditions, without the pres-

ence of the State, gold mining can be- come a source of fi- nancing for NSAGs,

which, however, generally do not in-

tervene directly at the sites. Apart from the cases of Liptako- Gourma and north-ern Mali, there is no- where in the study area where such in- teractions have been documented.

BOX 3: REGIONAL VARIATIONS AND DISPARITIES IN SECURITY CHALLENGES ASSOCIATED WITH ARTISANAL GOLD MINING

In the Soum region of Burkina Faso, artisanal miners are reported to engage jihadist units to secure the sites, in exchange for payment, and in the east of the country, following the closure of certain sites by the state in 2018 to com- bat the financing of terrorist groups, miners are said to have turned to ji- hadists, who reo- pened some mines, such as the one in Kabonga (Crisis Group, 2019).

In northern Niger, despite the control of gold mining sites by former rebels and the presence of activities related to the criminal economy, there is no evidence to suggest that gold extraction constitutes a source of funding for destabilizing activities, let alone terrorist ones. On the contrary, it offers em- ployment alternatives that could deter involvement in the criminal econ- omy. Even in northern Mali, where the presence of armed groups in gold mining sites has been established, it has played a significant role in reducing banditry (Dubois, 2019). The closure of the Djado site by the Nigerien state reflects a certain caution rather than proof that artisanal mining finances destabilizing criminal activities.

In Chad, conflicts for the control of gold mining sites involve local popula- tions and militias aligned with or opposed to the central government. These confrontations reflect broader regional and national ten- sions rather than a struggle between criminal groups for control of the sector. Artisanal mining may act as an amplifier or perpetuator of pre-existing conflicts, but should not be considered as a sole cause (Chevrillon-Guibert, Gagnol, & Magrin, 2019).

Toward Sustainable Development and Stability: Addressing the Multifaceted Challenges of Artisanal and Semi-Industrial Gold Mining in the Former G5 Sahel Countries and Senegal

The comparative analysis of the current dynamics of artisanal gold mining in the G5 Sahel countries and Senegal highlights the complex relationship between mining exploitation and socio-economic development, environmental issues, and security concerns.

Development actors should recognize the extent of the phenomenon, which has been ignored or underestimated for too long due to the relative scarcity of available information, and the limited number of surveys conducted. Difficult access to mining sites and the lack of precise or approximate data complicate comparisons and the possibility of generalizing analyses. This lack of knowledge feeds prejudices by considering artisanal mining solely through a security lens, as a source of conflict and financing for the criminal economy. Although the complex relationship between artisanal mining and armed groups varies from region to region, countries where the security situation is most stable (Mauritania and Senegal) are also those where artisanal mining operates under the best conditions. Conversely, the discovery of gold in Darfur, Tibesti, or northern Mali has reignited community tensions, between rival armed groups, and with central authority. While the control of gold mining sites and the taxation of related activities are sources of conflict, gold exploitation has not led to a generalized increase in the level of violence.

Recommendation 1

Encourage research based on local and interdisciplinary partnerships to understand the driving role of artisanal mining activities within a broader context of revitalizing mineral extractivism and the economic development of the region. Furthermore, it is important to ensure that this research moves beyond a strictly security-focused perspective.

This analysis has demonstrated the potentials of ASGM in terms of job creation and as a factor for socio-economic development. However, it has also highlighted the exploitation of vulnerable groups and gender disparities. The need for inclusive policies ensuring equitable access to resources and the sharing of benefits from mining is more pressing than ever to protect human rights and the well-being of all stakeholders. The limited scope of current support mechanisms, controls, and regulations underscores the importance of strengthening the ca-

Recommendation 2

Recognise and rely on the existing internal organisations within the gold mining communities to improve regulation and control. Instead of imposing external organisational structures, consideration should be given to formalising the practical norms already in use and commonly accepted by the gold miners. This approach would facilitate a more effective governance model that respects the specific practices of the gold miners, thereby improving the regulation and control of artisanal gold mining activities.

REFERENCES BIBLIOGRAPHIQUES

Abass Saley, A., Baratoux, D., Baratoux, L., Ahoussi, K., Yao, K., & Kouamé, K. (2021). Evolution of the Koma Bangou gold panning site (Niger) From 1984 to 2020 using Landsat imagery. Earth and Space Science, 8 (11), p. WOS:000722485800003.

Abdou Amadou, S. (2020). Evaluation des impacts de l'exploitation artisanale de l'or sur le site d'orpaillage de Komabangou (Liptako, Niger). Liège: Sciences de l'environnement, Université Catholique de Louvain.

Afane, A., & Gagnol, L. (2020). Une ruée vers l'or contemporaine au Sahara: l'extractivisme aurifère informel au nord du Niger. VertigO - la revue électronique en sciences de l'environnement [En ligne], Volume 20 Numéro 3.

Arnaldi di Balme, A., & Lanzano, C. (2014). Gouverner l'éphémère; Étude sur l'organisation technique et politique de deux sites d'orpaillage (Bantara et Gombélèdougou, Burkina Faso). Ouagadougou: Laboraratoire Citoyennetés, Étude RECIT no 37.

Bamba, O., Souleymane, P., Sako, A., Kagambega, N., & Miningoui, M. (2015). Impact de l'artisanat minier sur les sols d'un environnement agricole amenagé au Burkina Faso. Ouagadougou: Université de Ouagadougou & Université de Dédougou Burkina Faso.

Bantenga, M. (1995). L'or des régions de Poura et de Gaoua: les vicissitudes de l'exploitation coloniale, 1925-1960. International Journal of African Historical Studies, pp. 563-576.

Bolay, M. (2022). Des réseaux aux chaînes d'approvisionnement. Économies morales et performances de moralisation dans le commerce de l'or au Mali post 2012. Politique Africaine, pp. 147-172.

Bouramanding, A., Carrasse, F., & Sissoko, A. (2023). Une rivière en péril. La Falémé en Afrique de l'Ouest. ÉcoRev n° 54.

Carbonnel, J.-P. (1991). 16-2 Les bases coutumières et contemporaines des droits de découverte, d'invention et d'exploitation des mines. Exemple de l'orpaillage au Burkina Faso et au Mali. Dans E. Le Bris, E. Le Roy, & P. Mathieu, L'appropriation de la terre en Afrique noire. Manuel d'analyse, de décision et de gestion foncières (pp. 122-130). Paris: Editions Karthala.

Chevrillon-Guibert, R., Gagnol, L., & Magrin, G. (2019). Les ruées vers l'or au Sahara et au nord du Sahel. Ferment de crise ou stabilisateur ? . Hérodote, 172, pp. 193-215.

Crisis Group. (2019). Reprendre en main la ruée vers l'or au Sahel central. Dakar/Bruxelles: International Crisis Group.

Dessertine, A., Chevrillon-Guibert, R., Gagnol, L., Betabelet, J., Malal Diallo, M., Petit-Roulet, R.,

. . . Géraud, M. (2022). Orpaillage et développement des territoires en Afrique : une équation difficile ? Dans E. Peyroux, E. Lavie, & V. Viel, Développement, changements globaux et dynamiques des territoires : théories, approches et perspectives de recherche (pp. 163-181). ISTE Editions.

Devisse, J. (1993). L'or. Dans J. Devisse, Vallées du Niger (pp. 344-357). Paris: Editions de la réunion des musées nationaux.

Doucouré, B. (2014). Développement de l'orpaillage et mutations dans les villages aurifères du sud-est du Sénégal. Africa Development / Afrique et Développement, 39(2), pp. 47-67.

Fereday, A. (2023). Labour-trafficking in ASGM. Assessing risks in the Sahara-Sahel goldfields. Geneva: OCWAR-T Research Report 3.

Gagnol, L., & Afane, A. (2019). De sable, d'or et de mercure. Note sur la production urbaine contrastée de la ruée vers l'or au Sahara . Afrique contemporaine, vol. 269-270, pp. 225-248.

Gagnol, L., & Ahmet Tchilouta, R. (2021). L'orpaillage au Sahara : un défi pour la stabilité des États. Politique étrangère, 2021/4 (Hiver), pp. 187-200.

Gagnol, L., Ahmet Tchilouta, R., & Afane, A. (2022). Enjeux territoriaux et éthiques de la régulation de la ruée vers l'or au nord du Niger. Revue internationale des études du développement, 249, pp. 173-196.

GRDR. (2014). [Monographie du Cercle de Kéniéba GRDR Kayes 2014]. kayes: République du Mali.

Grégoire, E., & Gagnol, L. (2017). Ruées vers l'or au Sahara : l'orpaillage dans le désert du Ténéré et le massif de l'Aïr (Niger). EchoGéo, « Sur le Vif ».

ITIE Mali. (2022). Rapport final pour l'année 2020. Bamako: ITE Mali.

Keita, S. (2001). Étude sur les mines artisanales et les exploitations à petites échelles au Mali. MMSD N°80.

Kiéthéga, J.-B. (1983). Volta Gold - L'or de la Volta Noire: archéologie et histoire de l'exploitation traditionelle (Région de Poura, Haute-Volta). Paris: Karthala.

Lanzano, C., & Arnaldi di Balme, L. (2017). Des « puits burkinabè » en Haute Guinée : processus et enjeux de la circulation de savoirs techniques dans le secteur minier artisanal. Autrepart, vol. 82, pp. 87-108.

Lanzano, C., & Arnaldi di Balme, L. (2021). Who owns the mud? Valuable leftovers, sociotechnical innovation and changing relations of production in artisanal gold mining (Burkina Faso). Journal of Agrarian Change, pp. 433-458.

Lanzano, C., Luning, S., & Ouédraogo, A. (2021). Insecurity in Burkina Faso – beyond conflict minerals: The complex links between artisanal gold mining and violence. The Nordic Africa Institute.

Leclerc-Olive, M., Ouedraogo, A., Traoré, T., & Mégret, Q. (2023). Étude de capitalisation sur l'orpaillage dans les pays du G5 Sahel et au Sénégal. . Dakar: Plateforme d'Analyse du Suivi et d'Apprentissage au Sahel, Production Pasas.

Maiga, F., Touré, A., Ouattara, I., & Doumbia, S. (2022). Les effets de l'orpaillage par drague sur la biodiversité aqua-tique de la rivière Baoulé dans la commune rurale de Kémékafo, région de Dioila. Revue Africaine des Sciences Sociales et de la Santé Publique, Volume 4 (1), pp. 39-47.

Maman Illatou, O. (2021). Impacts de l'orpaillage et de l'agriculture sur la qualité des eaux du Liptako nigérien : identification des hots spots des pollutions mé-talliques et organiques, transferts de connaissances entre recherche et terrain. Niamey: Ingénierie de l'environnement. IMT

- MINES ALES - IMT - Mines Alès École Mines - Télécom; Université Abdou Moumouni, NNT: 2021EMAL0014.

Manzo Diallo, I. (2020). Niger : Des enfants, souffre-douleur des sites aurifères du Nord. CENOZO.

Mbodj, F. (2009). Boom aurifère et dynamiques économiques entre Sénégal, Mali et Guinée. EchoGéo [En ligne], 8.

Megret, Q. (2013). Exploration anthropologique d'un « boom » aurifère dans la région Sud-Ouest du Burkina Faso. Paris: Géographie, Université Panthéon-Sorbonne - Paris 1, Univrsité Joseph Kizerbo (Ouagadou, Burkina Faso).

Megret, Q. (2023). De lavilla 44 à l'hôtel international Silmandé: Habitations "de fortune"des sites aurifères burkinabè. Habiter, 2023., pp. https://shs.hal.science/halshs-04082012.

Ndiaye, K. (2020). Le développement de l'orpaillage, son impact envrionnemental et sanitaire dans le sud-est du Sénégal : exemple du site aurifère de Bantako. Mémoire de Master, Sciences et Gestion de l'environnement, Université Catholique de Louvain.

ONUDC. (2023). Gold Trafficking in the Sahel. Transnational Organized Crime Threat Assessment

— Sahel. New York: Office des Nations unies contre la drogue et le crime (ONUDC).

Ouédraogo, A. (2020). Les détentrices de hangars de traitement de l'or face à la technique de cyanuration (sud-ouest du Burkina Faso). Journal des africanistes, 90-1, pp. 168-187.

Roamba, J. (2014). Risques environnementaux et sanitaires sur les sites d'orpaillage au Burkina Faso : cycle de vie des principaux polluants et perceptions des orpailleurs (cas du site Zougnazagmligne dans la commune rurale de Bouroum, région du Centre-Nord). Ouagadougou: Mé-

moire de master option eau et assainissement, Institut International d'ingénierie de l'eau et de l'environnement de Ouagadougou.

Sawadogo, E. (2021). Discours, pratiques et dynamiques environnementales autour de l'orpaillage dans la commune de Kampti, (Sud-ouest du Burkina Faso). Géographie. Université Panthéon-Sorbonne - Paris I; Université Joseph Ki-Zerbo (Ouagadougou, Burkina Faso).

Sawadogo, E., & Da, D. E. (2021). Enjeux de la mutation des techniques artisanales sur la formalisation de l'exploitation de l'or au Burkina Faso. EchoGéo [En ligne], 58.

Sawadogo, E., & Da, D. E. (2021). Enjeux de la mutation des techniques artisanales sur la formalisation de l'exploitation de l'or au Burkina Faso. EchoGéo [En ligne], 58.

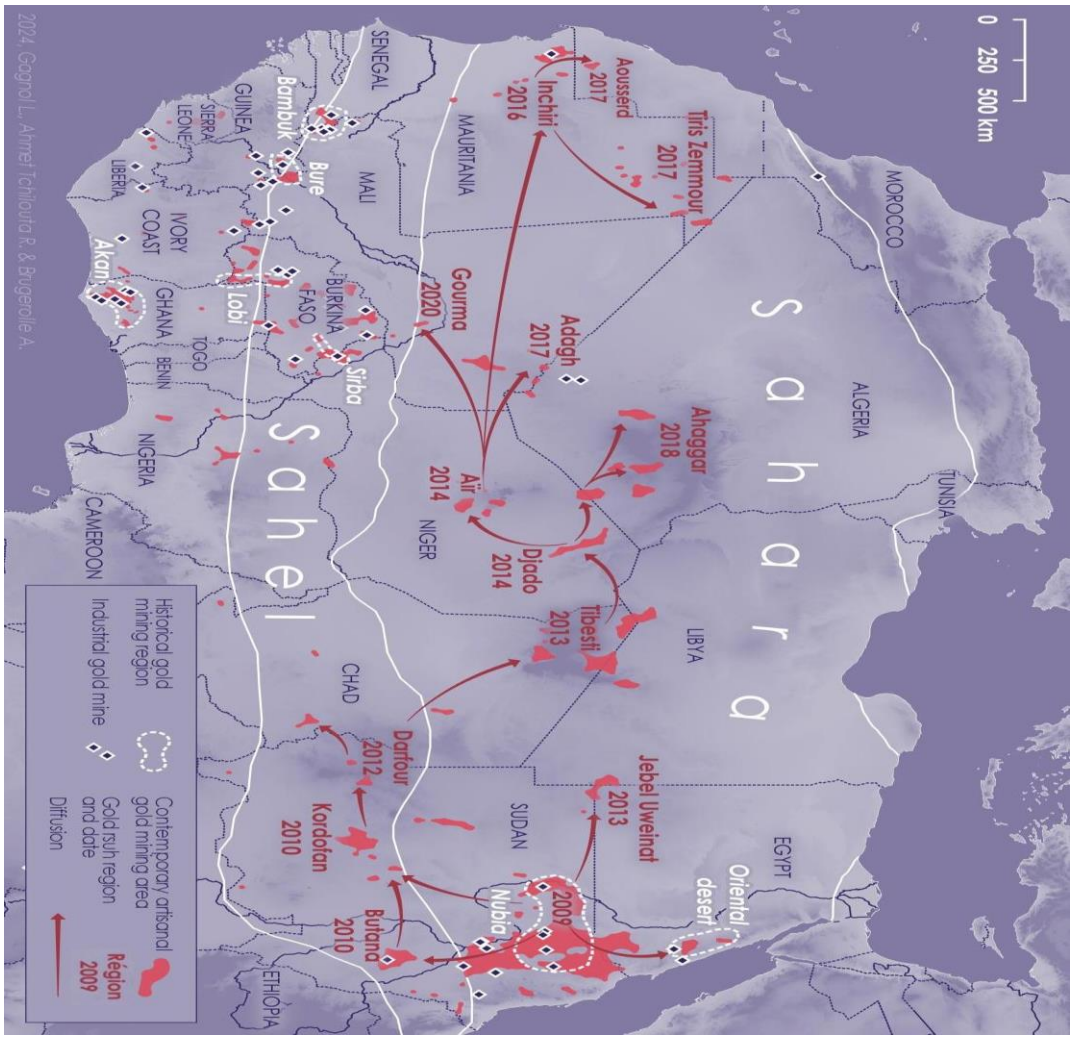
Seidou, A. (2013). Koma Bangou ou le mirage de l'or. Dans A. Boureima, & D. Lawali, Sahel : entre crises et espoirs (pp. 285-304). Paris: Karthala.

Verbrugge, B., Lanzano, C., & Libassi, M. (2021). The cyanide revolution: Efficiency gains and exclusion in artisanal- and small-scale gold mining. Geoforum, pp. 267-276.

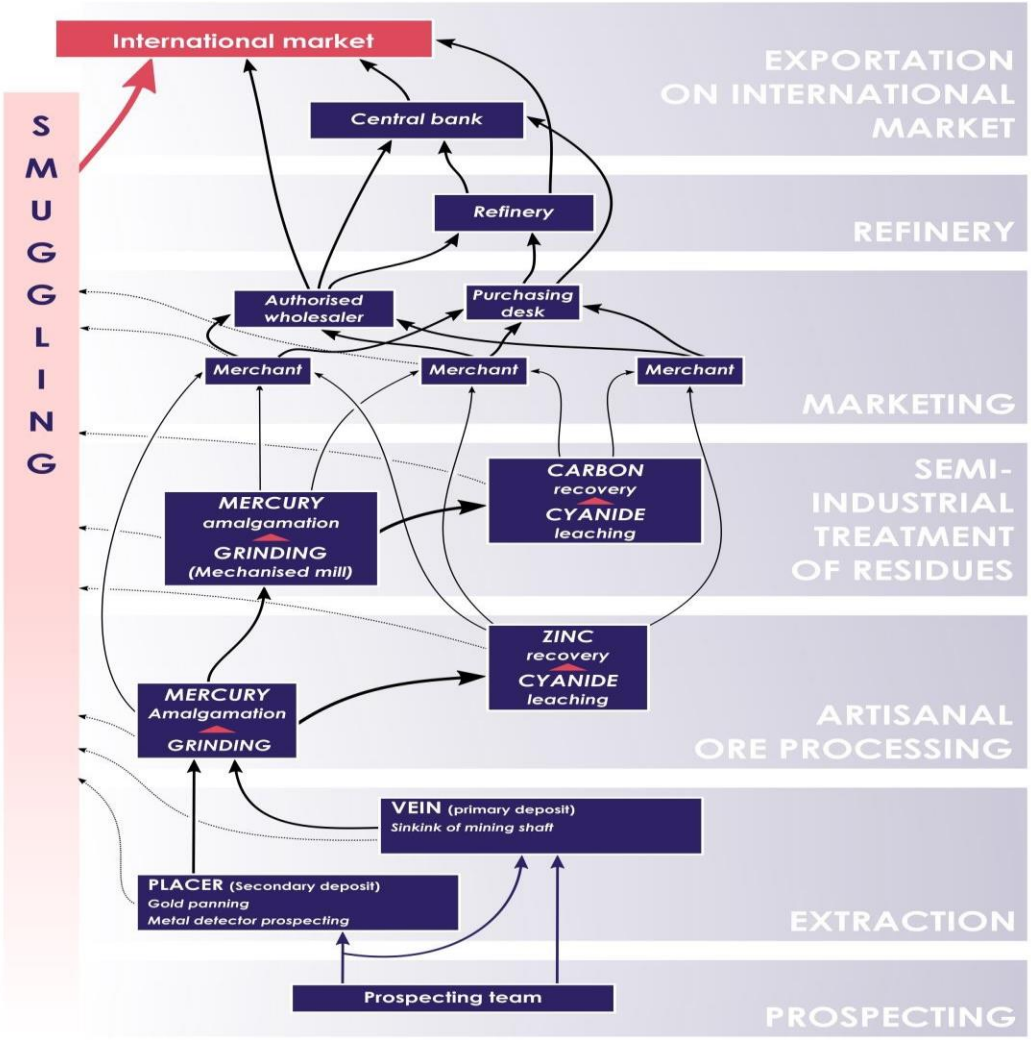
VOA. (2024). Le Niger ouvre une enquête sur la saisie de plus d'une tonne d'or en Ethiopie. VOA Afrique.

APPENDIX

APPENDIX 1: MAP OF GOLD MINING IN THE SAHARA-SAHEL AND WEST AFRICA (GAGNOL L., AHMET TCHILOUTA R., AND BRUGEROLLE A., 2024)



APPENDIX 2: MAP OF GOLD MINING IN THE SAHARA-SAHEL AND WEST AFRICA (GAGNOL L., AHMET TCHILOUTA R., AND BRUGEROLLE A., 2024)



PASAS

PLATEFORME D'ANALYSE,
DE SUIVI ET D'APPRENTISSAGE
AU SAHEL

MINKA | PORTÉ PAR AFD AGENCE FRANÇAISE DE DÉVELOPPEMENT

pasas-minka.fr

Ce rapport a été élaboré dans le cadre d'un financement du Fonds Paix et Résilience Minka.

Le Fonds Minka, mis en œuvre par le groupe AFD, est la réponse opérationnelle de la France à l'enjeu de lutte contre la fragilisation des États et des sociétés. Lancé en 2017, Minka finance des projets dans des zones affectées par un conflit violent, avec un objectif : la consolidation de la paix. Il appuie ainsi quatre bassins de crise via quatre initiatives : l'Initiative Minka Sahel, l'Initiative Minka Lac Tchad, l'Initiative Minka RCA et l'Initiative Minka Moyen-Orient.

La Plateforme d'Analyse, de Suivi et d'Apprentissage au Sahel (PASAS) est financée par le Fonds Paix et Résilience Minka. Elle vise à éclairer les choix stratégiques et opérationnels des acteurs de développement locaux et internationaux, en lien avec les situations de crises et de fragilités au Sahel et dans le bassin du Lac Tchad. La PASAS se met en œuvre à travers d'un accord-cadre avec le groupement IRD-ICE après appel d'offres international dont le rôle est double : (i) produire des connaissances en réponse à nos enjeux opérationnels de consolidation de la paix au Sahel et (ii) valoriser ces connaissances à travers deux outils principaux : une plateforme numérique, accessible à l'externe, qui accueillera toutes les productions et des conférences d'échange autour des résultats des études. La plateforme soutient ainsi la production et le partage de connaissances, en rassemblant des analyses robustes sur les contextes sahéliens et du pourtour du Lac Tchad.

IRD Institut de Recherche pour le Développement FRANCE | ICE FRANCE | UK International Development Partnership | Progress | Prosperity | ALLIANCE SAHEL