

# Mapping of artisanal mining sites in western Mambasa, Ituri Province, Democratic Republic of the Congo



*International Peace  
Information Service*



**Tujenge**



**USAID**  
FROM THE AMERICAN PEOPLE

# EDITORIAL

## **Mapping of artisanal mining sites in western Mambasa, Ituri Province, Democratic Republic of the Congo**

Antwerp, October 2023

**Author:** Guillaume de Brier

**Investigators:** Augustin Djamugisa Bedidjo, Eric Madingaka Itakabobo, Francine Mave Kawambe, Isaac Baluzemyanzi Muchiga

**GIS mapping and data analysis:** Thomas Muller

**Cover photo:** Artisanal diggers whasing tailings from Kimia Mining's at the Penge site. (Source : Augustin Djamugisa Bedidjo, June 2022).

**Suggested reference:** IPIS (2023). **Mapping of artisanal mining sites in western Mambasa, Ituri Province, Democratic Republic of the Congo.** Antwerp.

For more information, contact: [guillaume.debrier@ipisresearch.be](mailto:guillaume.debrier@ipisresearch.be)

D/2023/4320/17

The **International Peace Information Service (IPIS)** is an independent research institute providing tailored information, analysis, capacity enhancement and policy advice to support those actors who want to realize a vision of durable peace, sustainable development and the fulfillment of human rights.

USAID's Partnership for the Development of Eastern Congo (P-DEC) has been made possible thanks to the support of the American people through the United States Agency for International Development (USAID). The project is implemented by Mercy Corps and in partnership with International Alert, the Wildlife Conservation Society, the Alliance for Responsible Mining, the International Peace Information Service, HIVE, the Fair Congo Foundation, APROHDIV, Justice Plus, SOFEPADI, CORACON, the Pole Institute, and other partners.

# TABLE OF CONTENTS

<b>EDITORIAL .....</b>	<b>2</b>
<b>LIST OF ACRONYMS .....</b>	<b>4</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>5</b>
<b>INTRODUCTION .....</b>	<b>7</b>
<b>1. METHODOLOGY .....</b>	<b>11</b>
<b>2. SOCIO-ECONOMIC OVERVIEW OF ARTISANAL MINERS .....</b>	<b>13</b>
2.1. Artisanal miners.....	13
2.2. Women on artisanal mining sites.....	14
2.3. Child labor .....	14
<b>3. SECURITY SITUATION: MILITARIZATION OF MINING ACTIVITIES .....</b>	<b>16</b>
3.1. Presence of armed groups.....	16
3.2. The 31st FARDC Brigade: a security company for Kimia Mining industrials?.....	16
3.3. Roadblocks: security vs. extortion? .....	20
<b>4. EXTRACTION OF MINERALS IN THE OWR: AN ECOLOGICAL DISASTER .....</b>	<b>22</b>
4.1. Exploitation of timber in the OWR.....	24
4.2. Use of mercury.....	24
4.3. Poaching .....	26
<b>5. FORMALIZATION OF ARTISANAL MINING .....</b>	<b>28</b>
5.1. Government services .....	28
5.2. Cooperatives .....	29
5.3. Digging permits.....	30
5.4. Mine status.....	30
<b>6. PRODUCTION, TYPES OF OPERATIONS AND WORKING CONDITIONS .....</b>	<b>32</b>
6.1. Production.....	32
6.2. Types of operations.....	32
6.3. Working conditions .....	33
<b>7. RECOMMENDATIONS FOR THE P-DEC PROJECT .....</b>	<b>34</b>
7.1. Areas of intervention .....	34
7.2. Actions to undertake .....	34
<b>BIBLIOGRAPHY .....</b>	<b>36</b>
Tools and platforms.....	37
Legislative texts .....	37

# LIST OF ACRONYMS

AFM	Administrateurs de Foyers Miniers (Mining Site Administrator)
ANR	Agence Nationale du Renseignement (National Intelligence Agency)
CAMI	Cadastre Minier (Mining cadastre)
CEGEMI	Centre d'expertise en Gestion Minière (Expertise Center On Mining Governance)
CMNC	Coopérative Minière Ngayo Congo (Ngayo Congo mining cooperative)
COMIBA	Coopérative Minière de Bafwabango (Bafwabango mining cooperative)
COSOC-GL	Coalition des Organisations de la Société Civile contre l'exploitation illégale des ressources dans la région des Grands-Lacs (The Coalition of Civil Society Organisations against the illegal exploitation of natural resources in the Great Lakes region).
CTPCM	Cellule Technique de Coordination et de Planification Minière (Technical Cell for Coordination and Mining Planning)
DGI	Direction Générale des Impôts (Congolese Government Revenue Authority)
DGM	Direction Générale de la Migration (National Immigration Agency)
DGRPI	Direction Générale des Recettes de la Province de l'Ituri (Ituri Province Revenue Authority)
FAO	Food and Agriculture Organization
FARDC	Force Armée de la République démocratique du Congo (Armed Forces of the Democratic Republic of the Congo)
CDF	Congolese francs
FFN	Fonds Forestier National (National Forestry Fund)
ICCN	Institut Congolais pour la Conservation de la Nature (Congolese Institute for the Conservation of Nature)
IOB	Institut pour des Politiques de Développement (Institute Of Development Policy)
IOM	International Organization for Migration
IPIS	International Peace Information Service
ODK	Open Data Kit
OIM	Organisation International des Migrations
OPJ	Officier de Police Judiciaire (Judiciary Police Officer)
CSO	Civil Society Organization
PCR	Police De Circulation Routière (Traffic Police)
PDEC	Partnership for the Development of Eastern Congo
PE	Permis d'Exploitation (Operating Permit)
PEPM	Permis d'Exploitation A Petite Échelle (Small-Scale Mining Permit)
PK	Point Kilométrique (Kilometer Marker)
PMH	Police Des Mines Et Des Hydrocarbures (Mining And Hydrocarbons Police)
PNC	Police Nationale Congolaise (Congolese National Police)
PR	Permis De Recherche (Research Permit)
DRC	Democratic Republic of the Congo
OWR	Okapi Wildlife Reserve
RN	Route Nationale (National Road)
SAEMAPE	Service d'Assistance et d'Encadrement de la Mine Artisanale et à Petite Échelle (artisanal and small-scale mining assistance and support service)
STAREC	Stabilization and Reconstruction Plan for Eastern DRC
UICN	International Union for Conservation of Nature
USAID	United States Agency for International Development
ZEA	Zone d'Exploitation Artisanale (artisanal mining zone)

# EXECUTIVE SUMMARY

Natural resources are the main source of wealth in western Mambasa (Ituri Province). The mining of these resources is the dominant economic activity in the area. Indeed, along with agriculture, artisanal gold mining is the main source of revenue. According to the mapping of mining sites in western Mambasa, we estimate that at least 13,600 people are directly involved in the production of gold, of whom 3 % are women and 8 % children under the age of 15. These estimates are based on visits to 41 mining sites across western Mambasa in June and July 2022.

The goal of this mapping is to gain a better understanding of the mining sector in western Mambasa from a socio-economic, security and environmental perspective. We hope that the collected data and the proposed analysis will help international, national, provincial and local actors, who are looking to contribute towards economic development, stability, and the protection of natural resources, and to develop activities that are compatible with the reality of the region.

In terms of security, we have noticed a significant decrease in the influence of non-state armed groups in recent years, giving way to an increased presence of the Congolese army, the FARDC. The expulsion of several Mai-Mai groups has restored peace and security at points of sales in Nia-Nia, Badengayo, Molokai, Bafwabango (km marker 51) and Bafwanakengele (km marker 25), as well as at nearby mining sites. At the same time, the FARDC 31st Brigade acts as a security agent by setting up roadblocks and patrolling the mining concessions that belong to the chief of the Bandaka chieftaincy ((chefferie) (north of the Embo River), and to the Chinese Kimia Mining company (further south, along the Ituri River), within and outside the Okapi Wildlife Reserve (OWR).

The use of the FARDC 31st Brigade to protect Kimia Mining, already denounced by the United Nations Group of Experts in 2016<sup>1</sup>, is a major cause of insecurity and of environmental destruction. Undisciplined elements of the 31st Brigade have perpetrated violent expulsions of artisanal miners from mining sites with the intention of handing over extraction (or keeping it in their control) to Kimia Mining. Further north, the chief of the Bandaka chieftaincy (chefferie) has called on the 31st Brigade to prevent guards from the Congolese Institute for the Conservation of Nature (ICCN) from dismantling mining sites in the OWR. According to members of civil society, there have already been altercations between the FARDC and the ICCN. This demonstrates the risk of conflict between two armed actors, both representing the Congolese government, but placed in opposition by private actors.

The mapping project has also identified several environmental issues in the area of study. First, there is a much more intensive use of mercury than in other mining sites in the Ituri Province and in eastern Congo. Furthermore, deforestation due to mining activities has been observed in 88 % of the mining sites visited. Other detrimental effects on the environment have been observed, in particular in sites within the OWR or in the vicinity. The study shows that poaching generates revenue for the native inhabitants of the OWR, for men in Mai-Mai groups, and for miners. And yet poaching affects chimpanzees, pangolins and duikers, species which have been recognized as endangered by the International Union for Conservation of Nature (IUCN). Moreover, satellite images have shown that Kimia Mining's activities have diverted the Ituri River from its natural bed. The environmental consequences are significant for local populations. Further upstream, the river's stock of fish has greatly diminished, the color of the water has changed, and its quality has deteriorated.<sup>2</sup>

Socio-economic indicators have shed light on poor working conditions in all artisanal mining sites: miners have hardly any protective equipment. The vast majority of accidents, however, occur in mining sites controlled by Kimia Mining, in the OWR. The Muchacha mining site alone accounts for an estimated 75 % of accidents and 69 % of injuries.

---

1 United Nations Group of Experts on the DRC, S/2016/1102, para. 69-70

2 Verweijen et al., Conservation, conflict and semi-industrial mining: the case of the eastern DRC, Analysis and Policy Brief n°49, University of Antwerp, 2022.

Furthermore, FARDC forces posted at roadblocks that lead to Kimia Mining sites prevent government inspectors from inspecting the sites. As a result, the Artisanal And Small-Scale Mining Assistance and Support Service (SAEMAPE) and the government mining authority inspect only 50 % of mining sites. These sites are located in the Bafwambaya and Bafwabango groupements, and to a lesser extent in the Yindi area. The same is true for cooperatives: 50 % of mining sites have a cooperative. These are the same ones visited by government inspectors.

Of the 41 mining sites visited, 13 are not located within a concession, and 28 are located within a concession whose mining title is held by a company. Recently, the Congolese Mining Cadastre (CAMI) published a map of the OWR showing an area at least 7 km inward from its original boundaries (Map 3, p.21). This caused serious on-site confusion and provided grounds for artisanal miners to exploit underground resources in the OWR. As a result of this new marked area, the Kimia Mining, MCC Resources SARL and Ratel Metal Congo SARL concessions are located outside the OWR. To our knowledge, this map has not been approved by the Congolese government.

The artisanal mining sector in western Mambasa presents many and complex challenges that compel the Partnership for the Development of Eastern Congo (P-DEC) to set forth ambitious goals in order to restore stability in the region. As shown by the security analysis, the Chinese Kimia Mining company plays a significantly destabilizing role in the area. In order to have an impact on the region's stability, local, national and provincial advocacy initiatives are necessary to put a stop to Kimia Mining's activities in the OWR and to demand mining site rehabilitation at the company's expense. P-DEC will be a means to initiate the relocation of artisanal miners currently active in the area (at least 6,000 according to our estimates) and to provide revenue-generating initiatives. For miners who wish to remain in the artisanal mining sector, there are relocation possibilities in the Yindi, Bafwambaya and Bafwabango regions. Relocation needs to be accompanied by measures to support formalization of the artisanal mining sector, such as assistance to cooperatives and government agencies, in order for mining sites to become "blue mines" and obtain qualification. Beyond artisanal mining, IPIS suggests to P-DEC to carry out a feasibility study on how to develop farming and sale of fowl, livestock and insects. The consumption of insects is an observed practice. An in-depth study of such a practice as a sustainable economic activity, however, has not been carried out. P-DEC could also add value to business enterprises carried out in local communities, such as the production of honey.

# INTRODUCTION

The Mambasa territory accounts for 56 % of Ituri Province. The vast majority of it is covered in forest, 20 % of which lies within the Okapi Wildlife Reserve (OWR). Due to its wealth of natural resources, this vital geographic area has become an economic and political battleground, and has caused tensions between native inhabitants, artisanal miners and conservationists. The OWR was created by Ministerial Decree on May 2nd, 1992 and was named a UNESCO World Heritage Site in 1996<sup>3</sup> It is managed by the Congolese Institute for the Conservation of Nature (ICCN)<sup>4</sup> Its mission is to ensure conservation and biodiversity, to encourage scientific research and to promote ecotourism while preserving biodiversity.<sup>5</sup> A total of 376 species of birds and 101 species of mammals have been identified in the OWR including the okapi (**Okapia johnstoni**) also known as the forest giraffe.<sup>6</sup> The reserve's biodiversity, however, is threatened by human activity, starting with the mining of natural resources (gold and timber). Due to its extensive forest cover, the Mambasa territory (six inhabitants/km<sup>2</sup> in 2009) is the least populated area in the Ituri Province.<sup>7</sup> Its lack of infrastructure enhances its isolated nature: none of the provincial roads (504 km) are asphalted, and while the 392-km Route Nationale 4 that runs through the OWR from east to west is well maintained, approximately 450 km worth of roads are in poor condition. Moreover, there is no airport in the Mambasa territory (only six landing strips)<sup>8</sup> This isolation and low population density may explain why the Mambasa territory has received so little attention from development and humanitarian actors, a situation that is even more marked to the west of the OWR, in western Mambasa territory. In recent years, large development or conflict-resolution programs have focused on the Djugu territory (the Zahabu Safi project, funded by USAID, the **Madini kwa Amani na Mandeleo**, project, funded by the Ministry of Foreign Affairs of the Netherlands), the Irumu territory (the Zahabu Safi project, part of the Stabilization and Reconstruction Plan for Eastern DRC (STAREC), funded by the international organization for migration (IOM)), and the Mahagi territory (the Nashikiri kwa Mazikilizano project, funded by the European Union). The last large-scale project in the western part of the OWR, which aimed to resolve conflict and promote local economic development, was the IOM Amani ni njia ya Maendeleo project, which ended in 2016.

The Partnership for the Development of Eastern Congo (P-DEC) strives to restore equilibrium in the western area of Mambasa by investing in: conflict early-warning systems in order to mitigate violence (result 1); decision-making processes within governance structures and social responsibility mechanisms (result 2); and viable economic activities with a private sector that is in favor of stability, interethnic cooperation and social cohesion (result 3).

The mapping of artisanal gold mining sites in the western Mambasa region and in the OWR has been conducted within the framework of the P-DEC project, funded by USAID from October 1, 2021 to August 14, 2025. The goal of the mapping effort is to inform P-DEC implementers about the security, environmental, social and economic aspects of artisanal gold mines within and to the west of the OWR. The mapping analysis will also enable P-DEC implementers to identify actors, challenges and interests that they should take into account prior to initiating conflict resolution and local economic development activities.

---

3 World Heritage Center, IUCN, Mission Report: Mission de suivi réactif de la Réserve de Faune à Okapis, Democratic Republic of the Congo (DRC), March 5-15 2014, p.7

4 <https://papaco.org/fr/wp-content/uploads/2015/07/METT-Okapi.pdf>

5 Law No.14/003 from February 11, 2014, quoted in Congo Profond.net: Environnement : l'ICCN fait toujours confiance en son partenaire WCS et menace de traduire ses détracteurs en justice, November 17, 2022. <https://congoprofond.net/environnement-liccn-fait-toujours-confiance-en-son-partenaire-wcs-et-menace-de-traduire-ses-detracteurs-en-justice/>

6 UNESCO, <https://whc.unesco.org/en/list/718/>

7 <https://www.azes-rdc.com/index.php?idart=1204&idrub=174&rubhote=> and IKV Pax Christi, Analyse de contexte de l'Ituri, January 2009, p. 7

8 <https://www.azes-rdc.com/index.php?idart=1204&idrub=174&rubhote=>

The mapping is based on visits to 41 mining sites across four different zones (Map 1)<sup>9</sup> :

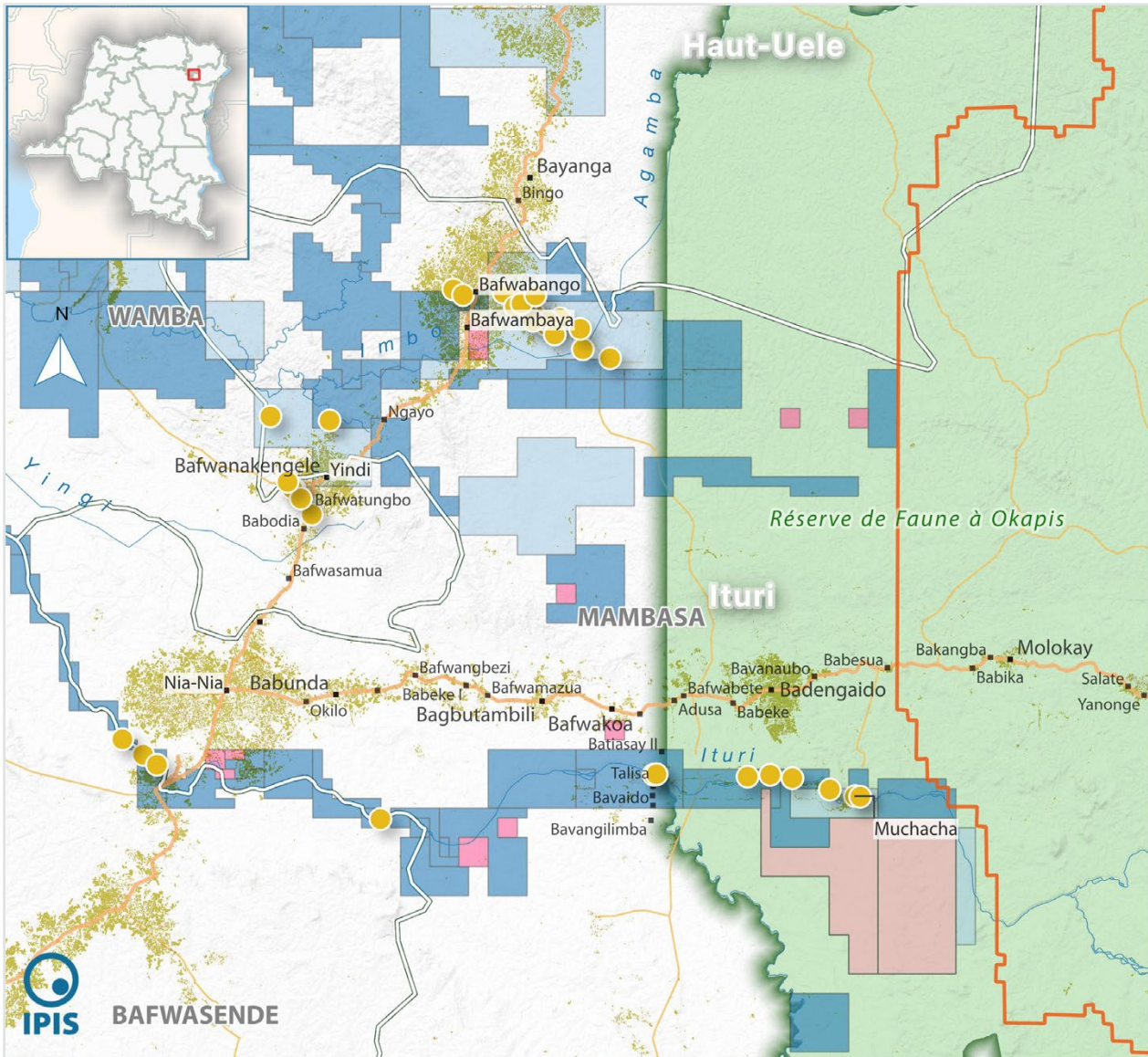
- The first zone furthest to the north is located between Bafwabango and Bafwabanya, to the west of the OWR. It includes around 15 sites over ten-or-so kilometers to the east of RN25 (two sites to the west). They are located in the following groupements: Bafwabambaya (13 sites), the Bandaka (two sites), Bafwabete (one site) and Bafwabango (one site).
- The second zone is located near Yindi on the RN25 around 20 kilometers south of the town. Six sites are located to the west of the RN25 and one is to the east. The sites are located in the following groupements: Ngayo (five sites) and Bafwana Kengele (two sites).
- The third zone, further south from the second one, is on the provincial border between Ituri and Tshopo. In Ituri, the closest city is Nia-Nia, less than one kilometer to the south of the first sites, and in Tshopo, it is Avakubi. The five sites of the third zone are located along the Ituri River and are part of the Bakundumu Ituri (3 sites) and the Bafwaio groupement (2 sites).
- The fourth zone concerns the mining sites within the OWR, mostly along the Ituri River and concentrated around Muchacha, the largest site. These 12 sites are located in the Babeke d'Isaye (6 sites), Bafwabeke (3 sites) and Enjewa (3 sites) groupements.

The main criteria when choosing mining sites was their proximity to the Nia-Nia region and the OWR, since P-DEC identified this region as its area of intervention. The sites within the OWR (zone 4) had to be part of the selection since one of the project's objectives is to relocate artisanal miners in the protected area to zones one, two and three, if possible. Sites were chosen according to information previously collected by IPIS, and pertaining to production and security.

---

9 To best visualize the areas that this study covers, see Map 1.





<p><b>Visites par les équipes d'IPIS (juin/juillet 2022)</b></p> <ul style="list-style-type: none"> <li>● Sites aurifères</li> </ul> <p><b>Limites de la RFO</b></p> <ul style="list-style-type: none"> <li>■ Limites officielles de la RFO (depuis 1992)</li> <li>□ Limites de la RFO sur le cadastre minier (CAMI)</li> </ul> <p><b>Limites de Territoire</b></p> <ul style="list-style-type: none"> <li>□ MAMBASA</li> </ul>	<p><b>Titres miniers (CAMI, 2022)</b></p> <ul style="list-style-type: none"> <li>■ Permis de Recherches</li> <li>■ Permis d'Exploitation</li> <li>■ Permis d'Exploitation des Petites Mines</li> <li>■ Zone d'Exploitation Artisanale</li> </ul>	<p><b>Routes et rivières (OSM)</b></p> <ul style="list-style-type: none"> <li>— Route nationale</li> <li>— Route secondaire</li> <li>— Rivière</li> </ul> <p><b>Perte du couvert forestier (Hansen, 2021)</b></p> <ul style="list-style-type: none"> <li>■ Entre 2001 et 2021</li> </ul> <p>Carte produite en juin 2023</p>
---	--	---

Map1: Location of artisanal sites visited by IPIS in June and July 2022<sup>10</sup>.

10 For more information on the mapping of forest cover loss, see: Hansen, et al. High-resolution global maps of 21st-century forest cover change, Science, 342.6160, 2013: 850-853.

The methodology section describes how the field data was collected.

The second section is a socio-economic overview of artisanal miners: how many there are, where they come from, the number of women workers and the tasks they are given. The analysis also includes information on child workers under the age of 15.

The third section focuses on the security aspect of the study area. We analysed the presence of state and non-state armed groups and reported on their interference with mining sites. The report also sheds light on the presence of roadblocks: Who controls them? Is payment demanded? Who requests it and what amount is requested?

The fourth section focuses on the environmental impact of mining sites within and outside the OWR. For sites within the OWR, it was also of interest to have an overview of the poaching caused by the presence of artisanal miners. We also collected data pertaining to timber exploitation by artisanal miners working in sites within and outside the OWR. Timber is used to build mine infrastructure, for daily requirements (cooking), or for sale. The study also provides information on the number of sites that use mercury to amalgamate gold, and on whether mercury users take into account its hazardous effect on households and nearby rivers.

The fifth section of the report focuses on two topics: the presence or interference of government services related to the artisanal mining sector, and the status of the mines. Information on the first topic includes the number of government services that have visited the mining sites in the past six months, and an analysis of their interaction with artisanal miners. The second topic addresses mining site locations and zones with mining titles (artisanal mining zones (ZEA), exploitation permits (PE), research permits (PR), and whether mines are located in the OWR protected area.

The sixth section concentrates on production, types of operations and working conditions.

The report's final section includes recommendations for the zones of intervention and the actions that P-DEC can implement.

# 1. METHODOLOGY

The mapping project is based on two field missions. The first one was conducted in June and July 2022 by two IPIS teams, each one made up of two investigators. Three out of four investigators are drawn from Ituri civil society and based in Bunia; the fourth one is employed by the SAEMAPE provincial office in Bunia. As a whole, both teams covered 41 mining sites across 11 groupements. Due to logistic and security issues, the investigators were not able to personally visit five sites. They collected information from the nearest village or trading center. As stated in the introduction, these sites were chosen due to their relative proximity to Nia-Nia, the area on which P-DEC focuses, or because they are located within or near the OWR. The same teams also identified 31 roadblocks and collected data regarding the individuals who control them, the possible payments requested and the requested amounts.

Data collection was carried out using a questionnaire done on a cell phone with the ODK Collect application. Investigators were previously trained on how to use the questionnaire and how to identify the best qualified individuals to answer it. The questionnaire included questions on security, production, the number of artisanal miners (men, women and children), working conditions, the presence of government agencies, their on-site operations and the environmental impact of mining. Once the data was checked and cleaned, IPIS used R software (version 4.2.1) to analyze it.

The second field mission was conducted by a national expert on the artisanal mining sector and an IPIS investigator from the first field mission, between October 14 and 31, 2022. This mission's purpose was to analyze the dynamics of local mining conflict, identify the main actors and their interests, and the triggers and underlying causes of the conflict. Finally, based on the study's conclusions, it would determine which government, civil society or private organization could benefit from P-DEC's support. The mining sites' proximity to the Nia-Nia region and the OWR —P-DEC's areas of intervention— was the main criteria for choosing sites to visit. The second criteria involved identifying sites that IPIS teams could safely travel to, or, in the event it was too dangerous, at least be able to collect first-hand information at a distance from the site.

In addition to field mission information, and in order to observe changes in the OWR forest cover since 2017, IPIS also studied data collected by the Sentinel-2B satellite<sup>11</sup>. Thanks to the Digital Earth Africa platform<sup>12</sup>, the data was processed to produce cloud-free composite images, and analyzed to quantify any observed differences.

To best estimate security, working conditions and the environmental impact of mining activities, we used data collected through Kufatilia, an incident-reporting system set up by IPIS and Ulula. The Kufatilia system works using SMS text messages. By sending the word "Kufatilia", mining community members and civil society operators can report incidents pertaining to mineral extraction, transport and commerce. The collected information is entered into an online database and incidents are processed by Civil Society Organizations (CSOs) with the support of the expertise center on mining governance (CEGEMI). CSOs can work together in a participatory manner to validate and monitor reported incidents transparently and independently.

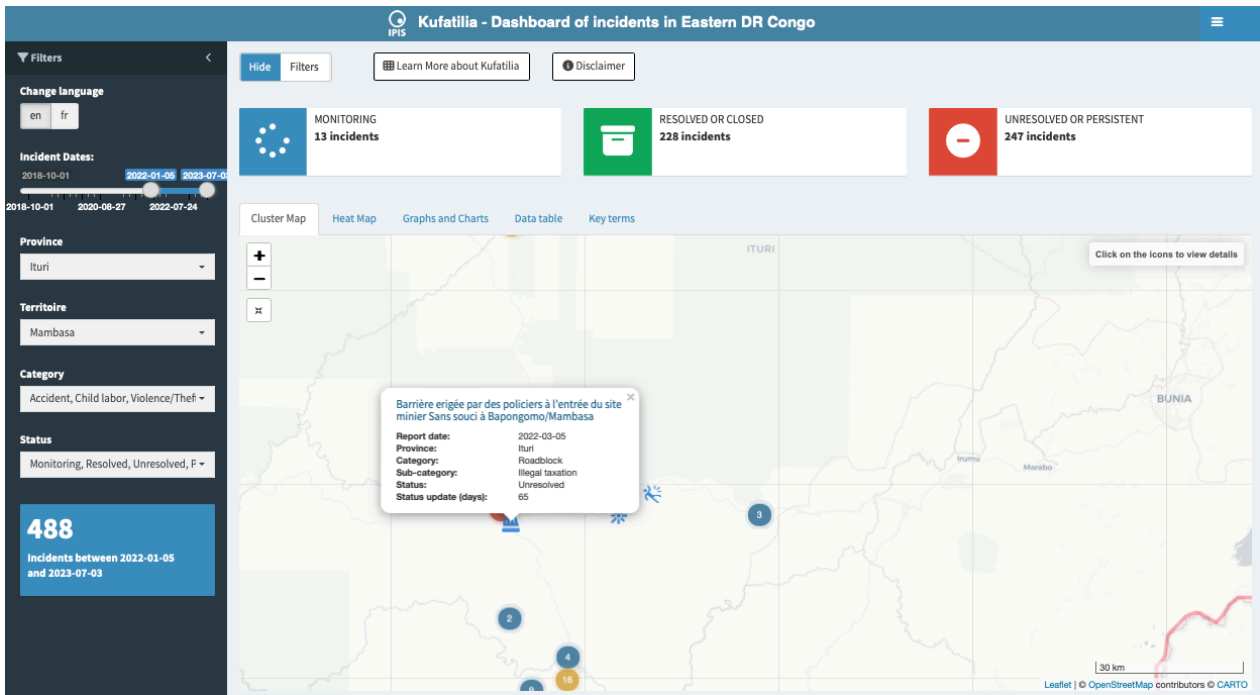
Incidents on the Kufatilia<sup>13</sup> dashboard are attributed, as correctly as possible, to the province or territory in which they were reported. Dashboard geolocalization, however, does not indicate the exact location of the incident. Often, the location is the capital of the province or territory. Between January 1, 2022 and July 31, 2022, the dashboard reported 221 incidents in the Ituri Province and in the Mambasa territory. IPIS analyzed each incident to check if it had taken place in P-DEC's area of intervention by searching for a location indicator (mining site, village, hamlet, kilometer marker, etc.) in the incident description.

---

11 <https://sentinels.copernicus.eu/web/sentinel/missions>

12 <https://docs.digitalearthafrika.org/en/latest/>

13 [https://ipisresearch-dashboard.shinyapps.io/kufatilia\\_app/](https://ipisresearch-dashboard.shinyapps.io/kufatilia_app/)



*Dashboard of reported incidents on the Kufatilia platform.*

## 2. SOCIO-ECONOMIC OVERVIEW OF ARTISANAL MINERS

### 2.1. Artisanal miners

IPIS investigators estimated the number of artisanal miners at 13,668 across the 41 artisanal gold mines they visited. This results in an average of 333 artisanal miners per site. There is, however, a discrepancy between sites with particularly large numbers of miners (the number at the Muchacha site is estimated at 3,500 and at 1,500 in Libreville) and those with a much smaller labor force (three sites have less than 20 artisanal miners). The median number of artisanal miners is 105 (Figure 1).

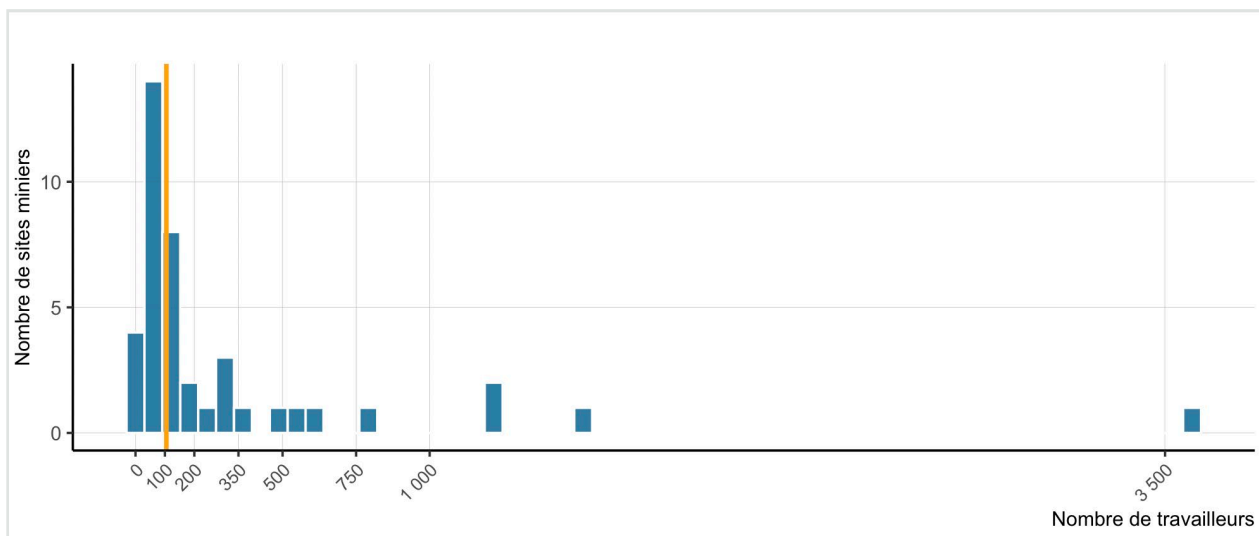


Figure 1: Number of workers per mining site (histogram). The median of 105 workers is represented by the yellow line on the graph.

The majority of artisanal miners are located in mining sites along the Ituri river, in zone 4, and further north, at the border with the OWR, between Bafwambaya and Bafwabango (zone 1) (Map 1 and Table 1). Conversely, mining sites around Yindi (zone 2) and those on the provincial border with Tshopo to the south of Nia-Nia (zone 3) are fewer and have a smaller labor force (Table 1, Figure 2).

**Table 1: Distribution of artisanal miners in the four study zones in western Mambasa (June-July 2022).**

	Nombre de mineurs artisanaux	Moyenne des mineurs artisanaux par site	Médiane des mineurs artisanaux par site	Nombre de sites miniers
<b>Sites between Bafwambaya and Bafwabango (Zone 1)</b>	6 219 (45 %)	366	175	17 (42 %)
<b>Sites around Yindi (Zone 2)</b>	677 (5 %)	97	100	7 (17 %)
<b>Sites south of Nia-Nia (Zone 3)</b>	336 (3 %)	67	48	5 (12 %)
<b>Sites around Muchacha (Zone 4)</b>	6 436 (47 %)	536	118	12 (29 %)
<b>TOTAL</b>	13 668 (100 %)			41 (100 %)

An overview of the origin of artisanal miners in western Mambasa illustrates the attraction mining offers to people who lack qualification and/or who do not own land. At 38 out of 41 sites, artisanal miners migrated from DRC provinces other than Ituri. The majority of them come from nearby provinces such as Tshopo (present on 36 mining sites) and Haut-Uélé (24 sites), but some are from North Kivu (16 sites), South Kivu (nine sites), and even from Equateur province (three sites). Artisanal miners who are not originally from the area thus make up the large majority of workers on mines sites in our study (estimated at around 11,200 out of 13,686, or 82 %).



Figure 2: Number of workers per study zone (logarithmic scale). The median value is shown in red; minimum and maximum values are in yellow.

## 2.2. Women on artisanal mining sites

The labor force directly involved in mining minerals is essentially male. Investigators estimated a number of 442 women miners across 15 sites. The presence of women was observed mainly in sites in zone 1 between Bafwambaya and Bafwabango (379 out of 442 women, or 85 %), and particularly at the large Mbujimayi site (total of 1,200 artisanal miners), where they represent 41 % of the entire female labor force (185 women miners). Hence, women miners account for approximately 3 % of the total estimated number of artisanal miners. On the only mining sites in which women are involved in the production of minerals, they represent approximately 10 % of the labor force (442 women out of 4,446 miners). Women on the sites mainly handle mineral processing (13 out of 15 sites), washing (11 sites), digging (10 sites, one case of underground work) and transport (6 sites).

If we take into account indirect activities that support artisanal mining, the presence of women is increasing considerably. Women, present on 34 out of 41 sites, run restaurants, bring food to artisanal miners (25 sites), bring water (10 sites) or other goods (11 sites). Sex work is also widespread and was observed in 21 mining sites.

## 2.3. Child labor

Present on 51 % of mining sites (21 out of 41 sites), the number of children is estimated at 1,098 and represents 8 % of the total artisanal mining labor force (or 11 % of the labor force on the 21 sites where children work). The Muchacha mining site in the OWR (360 children out of 3,600 artisanal miners, or 10 % of the labor force) and the Mbujimayi site located between Bafwambaya and Bafwabango (270 children out of 1,200 artisanal miners, or 22.5 % of the labor force), account for 57 % of the total estimated child labor force.

Children's tasks mainly include washing minerals (17 out of 21 sites) and processing them (15 sites). Children are also employed to dig pits (13 sites) and to manipulate mercury (9 sites). These two activities are particularly hazardous and are considered to be among the worst forms of child labor. According to

artisanal miners, these children do not go to school. It may be possible, however, that certain children were simply working during school holidays since the site visits were conducted in June and July.<sup>14</sup>

Taking into account the indirect activities carried out by children under 15 on mining sites, child labor is present at 70 % of sites (29 out of 41 sites). In most mining sites, children are employed in restaurants (18 out of 29 sites), to transport food (14 sites), goods (10 sites), and water (10 sites). The situation of young girls living in mining camps surrounding the Muchacha sites is particularly disturbing. In at least seven of them, IPIS investigators noted forms of child prostitution.



*Caption: Artisanal miners washing minerals in the Muchacha mining site.*

Between January 1 and July 31, 2022, the Kufatilia dashboard reported 221 incidents in the Mambasa territory. IPIS has verified the exact location of each incident and was able to identify 112 in the zone covered by P-DEC: 8 of these 112 incidents concerned child labor in mineral extraction.

---

14 G. de Brier, Rapport quantitatif de la mission IPIS pour le projet Madini dans le groupement de Ngandja (Misisi), territoire de Fizi (Sud Kivu), IPIS, Antwerp, June 2022, p. 23.

## 3. SECURITY SITUATION: MILITARIZATION OF MINING ACTIVITIES

### 3.1. Presence of armed groups

In April 2012, the Mai-Mai Simba occupied the OWR and used it as a support base for their operations. In October of the same year, they were able to take control of the Muchacha mine. In 2014, after the unexplained death of Morgan, their leader, during his surrender to the FARDC,<sup>15</sup> the Mai-Mai Simba split into two groups: the Mangaribi, led by Morgan's brother, and the Manu, led by one of Morgan's former lieutenants.<sup>16</sup> The FARDC successfully continued to chase both armed groups. In September 2016, they retook control of the Muchacha mine<sup>17</sup>. Weakened, the Mai-Mai Simba led by Mangaribi were able to maintain control over a few gold mines in the Enjewa groupement, near Muchacha, and mines from the Badumbisa and Basiri groupement (Bombo chieftaincy) at least until November 2021.<sup>18</sup> In 2022, during a field visit, a site chief stated that the Mai-Mai Simba only survived thanks to bushmeat poached and sold to artisanal miners at the Kputuka site.<sup>19</sup> In March 2022, the Asomba Liwa armed group still controlled the Zwa Idée mining site in the OWR. In February 2023, the arrest of one of their members<sup>20</sup> led to retaliatory violence by Asomba Liwa around km marker 51.<sup>21</sup>

Today, the threat of non-state armed groups has been drastically reduced, but instability-triggering elements remain. First, undisciplined FARDC elements are paid by foreign semi-industrial miners to ensure the security of their personnel and to monitor the zones they control; second, the availability of an online DRC Mining Cadastre map (CAMI), which changed the OWR boundaries and shrunk its surface, has set individuals against each other: ICCN agents in charge of protecting the reserve against artisanal miners, semi-industrial Chinese miners, and the local population which wants to exploit the area's natural resources.

### 3.2. The 31st FARDC Brigade: a security company for Kimia Mining industrials?

Ever since the 31st FARDC Brigade gained control over the region, it has behaved like a security company by offering its services to private individuals. In the Bombo-Baguma chieftaincy (chefferie), to the south of the area of study, mining sites along the Ituri river are exploited by the Chinese Kimia Mining company, which pays undisciplined elements of the 31<sup>st</sup> Brigade to protect its sites and equipment. The permanent presence of FARDC elements keeps the different armed groups at a distance. This is also beneficial for inhabitants of mining communities in the OWR.<sup>22</sup> For example, a Mai Mai Mangaribi base near the Kulungu mining site was dismantled by the FARDC in early 2022. The expulsion of the Mai-Mai had a positive impact on security: artisanal miners could drive peacefully in the area both during the day and at night.<sup>23</sup>

Numerous artisanal miners, however, are upset by the use of undisciplined FARDC elements by Kimia Mining. They believe that the Congolese army should protect its citizens rather than the interests of foreign individuals and companies. Kimia Mining has called upon the 31st Brigade to drive out artisanal miners in at least seven artisanal mining sites.<sup>24</sup> According to the miners, there was no negotiation, and many of them lost their investments without any form of compensation. On behalf of Kimia Mining, the

15 RFI, Mort du chef Mai-Mai Morgan : que s'est-il passé à Molokai ? RFI, May 5, 2014.

16 G. de Brier and H. Merket: Artisanal Gold Monitoring Pilot in Mambasa, Ituri, Monitoring report, IPIS, Antwerp, September 2017, p.12.

17 G. de Brier and H. Merket, *ibidem*.

18 United Nations Group of Experts on the DRC, S/2022/479, para. 146

19 Interview with a site chief in Kputuka, July 6, 2022.

20 <https://www.facebook.com/watch/?v=521034626836563>

21 Interview with a civil society member from Nia-Nia, April 2023.

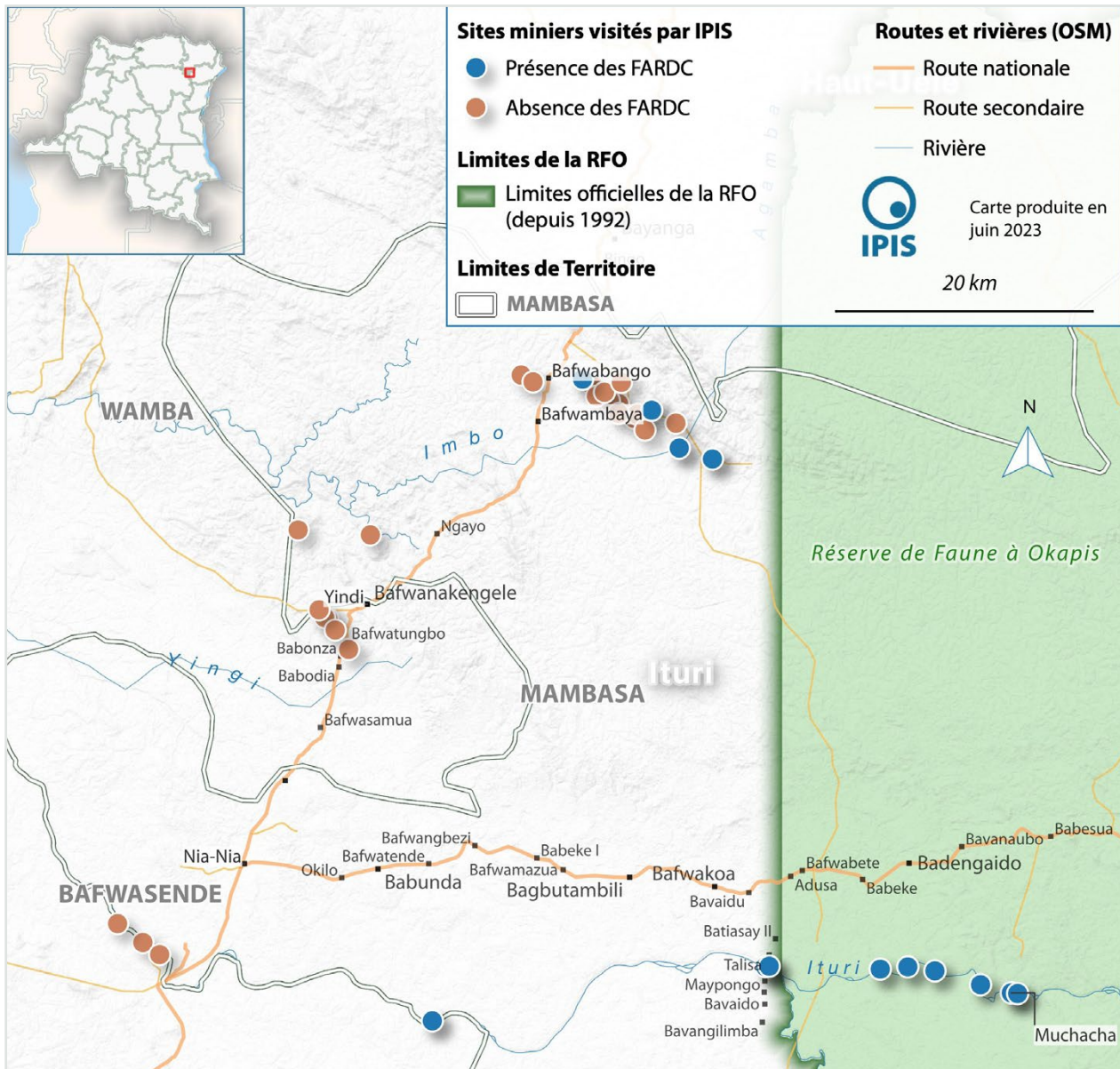
22 IPIS, field visit, June-July 2022, also confirmed by Verweijen et al., Conservation, conflict and semi-industrial mining: the case of the eastern DRC, Analysis and Policy Brief n°2022, University of Antwerp, 49, p. 5

23 IPIS, Field visit, June-July 2022.

24 *Ibidem*.



31st FARDC Brigade has prevented the digging of any pits to anyone foreign to the Chinese company and allows only certain artisanal miners to exploit the company's tailings. Data pertaining to current conflicts and violence also show that tension with artisanal miners exists in every Kimia Mining site. Due to the absence of official or traditional mediators, situations will only escalate. According to artisanal miners, the Chinese company pays the chieftancy (chefferie) and government services to rule in their favor. The Congolese National Police (PNC) is also paid by Kimia Mining to protect its Chinese expatriate employees when they travel to the trading centers in Nia-Nia.<sup>25</sup> The presence of the PNC was observed at six mining sites.<sup>26</sup>



Map 2: Observed presence of FARDC in mining sites visited by IPIS in June and July 2022.

25 Idem

26 IPIS interview with artisanal miners, June-July 2022.

The presence of the FARDC has been observed in 15 artisanal mining sites. The map shows that they control all the sites along the Ituri river within the OWR. Their presence is permanent. Interference by undisciplined FARDC elements has been observed for at least ten years in artisanal mining sites, particularly those within or near the OWR.<sup>27</sup> Their methods of interference include roadblocks where travelers are taxed, forced labor for their own benefit, and possession and/or operation of pits.<sup>28</sup> In 2016, the United Nations Group of Experts on the DRC had already noted that the 31st FARDC Brigade had secured the dredging operations of the Chinese Kimia Mining company.<sup>29</sup>

According to testimonials from the field collected by IPIS, the FARDC colonel who leads the 31<sup>st</sup> Brigade is the main exploiter of timber. Apparently protected by provincial government authorities, he is also thought to be involved in the illegal exploitation of gold. By involving senior officers in mining site operations within the OWR, Chinese companies are able to keep government services away from sites.<sup>30</sup> In addition, the meager and irregular wages of undisciplined FARDC elements prompt them to look for other sources of revenue and hence, accept offers to protect sites and evict artisanal miners.<sup>31</sup> Finally, since Chinese companies must pay wages for mobilized military forces, senior officers are able to keep the official wages of their troops for themselves.<sup>32</sup>

Further to the north, near the OWR border, on the road that runs through Bafwambaya and Bafwabango, investigators visited 17 sites. The apprehension and/or dismantling of non-state armed groups combined with the omnipresence of the FARDC, reinforced security around the points of sale in Nia-Nia, Badengaido, Molokay, Bafwabango (km marker 51) and Bafwanakengele (km marker 25). The presence of the FARDC in the Bafwabango trading center provides an effective form of security for nearby artisanal mining sites. In both sites near Bafwanbogo, where the FARDC are present (Camp Base and Mambo Bado), artisanal miners applaud the role of the military in securing the zone, even if it costs between 2,000 CDF (0.48 USD) and 10,000 CDF (4.8 USD) per artisanal miner per month. Other FARDC and PNC elements are posted at the entrance of Kilo Goldmines LTD, which was attacked by the Mai-Mai on July 17, 2020,<sup>33</sup> and in Adombi in order to protect the company's airfield and material.

The situation is more complicated on the other side of the Embo river. IPIS investigators were only able to visit two artisanal mining sites: Eswyio wapi and Paradis. Soldiers based at Eswyio wapi prevented them from continuing their mission unless they were accompanied by armed men. According to artisanal miners, these undisciplined elements from the 31st FARDC Brigade work for the chief of the Bandaka chieftancy who owns the mining sites in the area. He supposedly expressly instructed the 31<sup>st</sup> Brigade to monitor his sites in order to prevent ICCN guards from destroying his concessions, which he says are located outside the OWR. According to testimonials, ICCN guards dismantle any mining installation that they find within the OWR. When ICCN patrols approach a site that belongs to the Bandaka chief, FARDC elements are called for reinforcement. The OWR map that CAMI published online and which shows a reduced area of the reserve, substantiates the Bandaka chief's statement that his sites are not within the protected area. The ICCN subsequently accused the CAMI of relaying the map's information.<sup>34</sup> To our knowledge, the Congolese government has not made an official statement to ratify the new markings.

27 Schouten, Exploiter (dans) le désordre : Cartographie sécuritaire du secteur aurifère à Mambasa occidentale, PAX, September 2015.

28 Ibidem, pp.45-46

29 United Nations Group of Experts on the DRC, S/2016/1102, para.69-70

30 Verweijen et al., Conservation, conflict and semi-industrial mining : the case of eastern DRC, University of Antwerp, Analysis and Policy Brief n°49, Antwerp, 2022, p.4

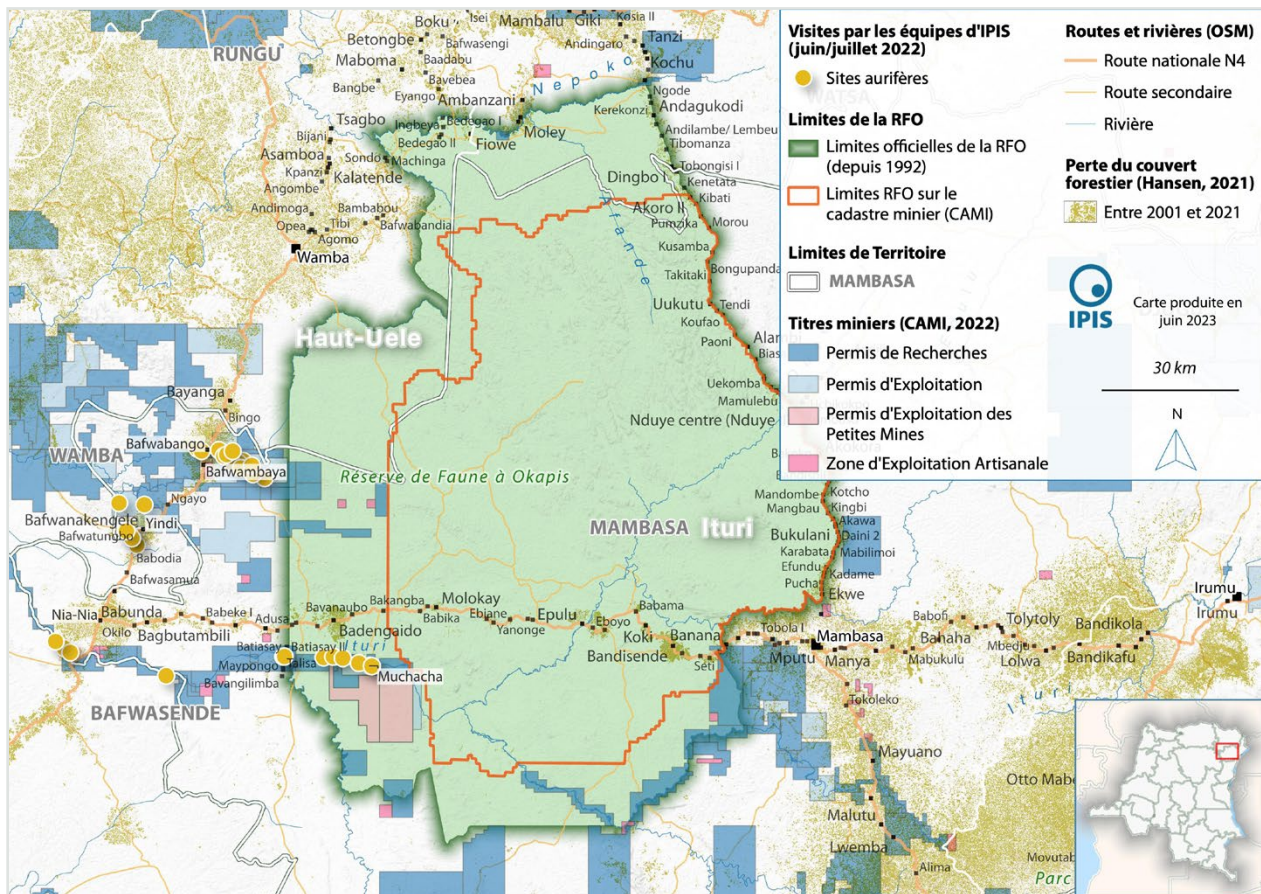
31 B.Sabbe, Grievance, governance and gold in Eastern DRC, IPIS Briefing, January 2022.

32 The Congolese press and NGOs have shown that officers stealing their soldiers' wages is a regular occurrence. See <https://actualite.cd/2020/10/29/rdc-adf-un-officier-fardc-disparait-avec-la-solde-des-militaires-engages-sur-laxe-mbau>, <https://www.dw.com/fr/rdc-fardc-ituri-detournements-soldats-fictifs/a-58037949> and <https://blog.kivusecurity.org/whos-stealing-the-fardcs-money/>

33 Electionnet, Ituri: Incursion de miliciens dans un carré minier à Mambasa, February 20, 2022, <https://www.election-net.com/article/ituri-incursion-des-miliciens-dans-un-carre-minier-a-mambasa>.

34 Verweijen et al., Conservation, conflict and semi-industrial mining : the case of the eastern DRC, Analysis and Policy Brief n°49, University of Antwerp, 2022, p. 4-5

Hence, the 1992 boundaries remain official. According to a member of civil society, armed skirmishes took place between the ICCN and the FARDC, both institutions which represent the Congolese government. This has been a major cause of destabilization in the region and a strong indicator of poor governance.



Map 3: The OWR boundaries set in 1992 and those published by the DRC Mining Cadastre portal<sup>35</sup> (adapted from an IPIS map in Verweijen et al., 2022).

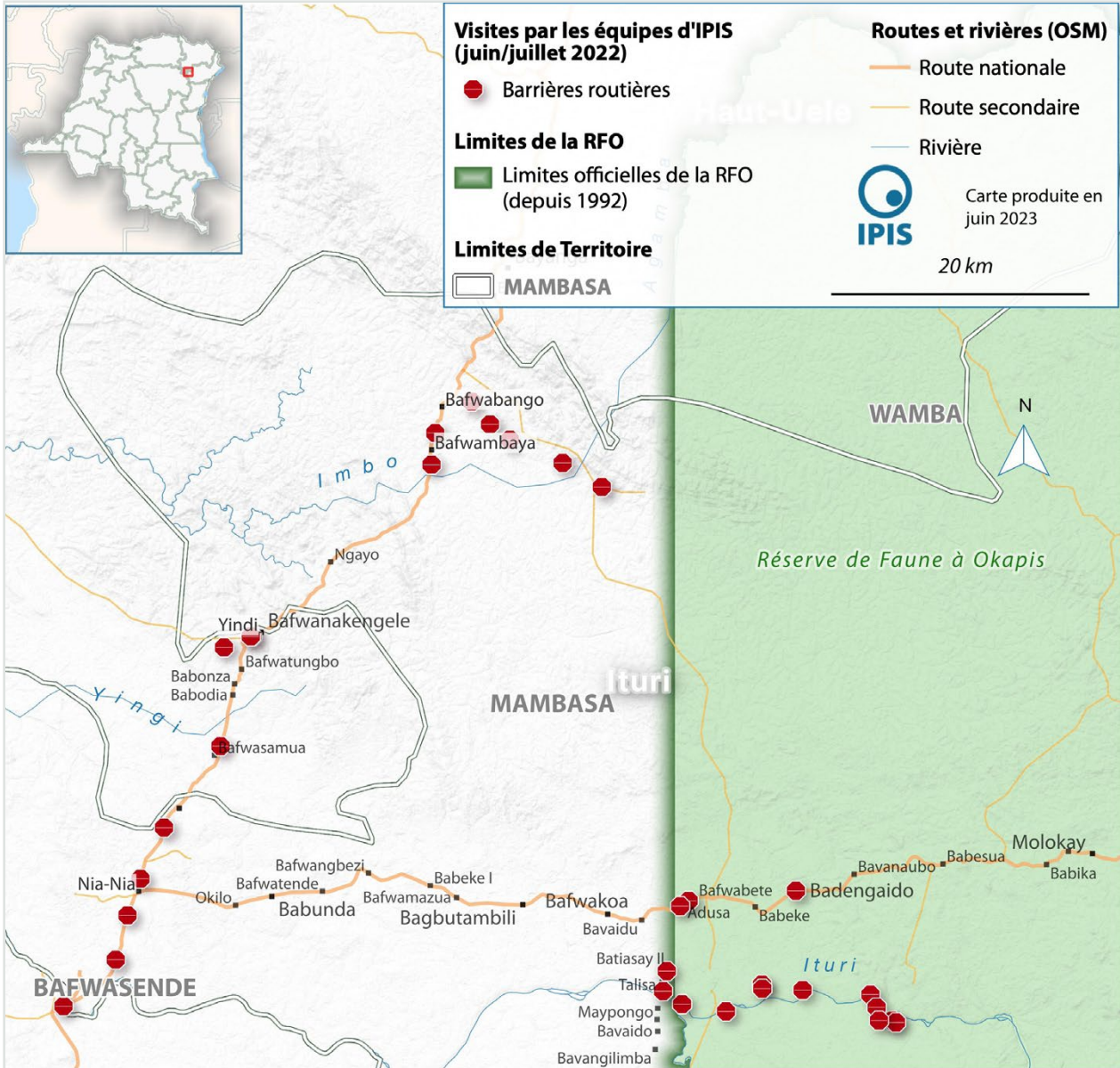
When artisanal miners (or their chiefs) appeal to the FARDC, it gives rise to “spontaneous collections” among miners of about 10,000 CDF (4.8 USD) per person. The usual charges from the FARDC across the four sites where they are present amount to between 500 CDF (0.24 USD) and 5,000 FC (2.4 USD) every 15 days. Moreover, undisciplined FARDC elements hold a monopoly on the sale of hemp and cigarettes (1 out of 4 sites).

There is no armed group and none major security incidents have been reported in the seven sites visited in the third zone, south of Nia-Nia, on the border with the Tshopo Province, the Ngayo and Bafwanakengele groupements (Bombo chieftaincy).

35 <http://drclicences.cami.cd/en/>. Site visited on June 30, 2023.

### 3.3. Roadblocks: security vs. extortion?

The IPIS teams working on the P-DEC project identified 31 roadblocks more or less equally dispersed across the areas of study (Map 4): 11 of them were located on a national road, seven on mineral evacuation routes, and two on tracks. The remaining 11 roadblocks were located on a road built by the Kimia Mining company. Of the 11 roadblocks on the mining company's evacuation routes, ten of them are run by the 311th Battalion of the 31st FARDC Brigade; the eleventh one is run by youngsters from Bandaka who are paid by Kimia Mining.



Map 4: Location of roadblocks visited by IPIS in June and July 2022.

We identified 18 other entities (20 in total) that run roadblocks. The majority of roadblocks (20 out of 31, or 64.5 %) are run by a single entity. Often, they are built at the exit of an industrial or artisanal mining concession, or on an evacuation route (18 out of 21). Half of them are run by the 311th Battalion and built on an evacuation route on a Kimia Mining site (nine roadblocks). Finally, 11 roadblocks are run jointly by two, three, four or even five different state controllers.

FARDC military forces are the main group at roadblocks (18 out of 31 roadblocks, or 58 %). Civilians complain about harassment concerning bags or identity checks. For example, people without ID must pay a fine. The FARDC are particularly strict about identity checks in more critical areas, such as the entrance to the Muchacha site. Some soldiers use satellite phones to ask their chiefs in the Kimia Mining base camps whether or not to grant passage to certain people. The traffic police (seven roadblocks), the Congolese National Police (three roadblocks), and the Criminal Police (one roadblock) are present at 11 roadblocks. The PCR may ask motorcycles to pay 2,000 CDF (1 USD) at certain roadblocks. More often than not, they are present in addition to other state entities, and conduct bag and identity checks. Two roadblocks are run by “site brigades” or “site customs”. These groups work for the site’s owner and are meant to watch that nobody takes gold from the site, and to prohibit people from bringing certain goods, over which the site owner has a sales monopoly, into the site (alcohol, beer, cigarettes, flour, soap, mercury, vegetable oil).

Other entities who run roadblocks see working with security agents, such as the army or the police, as an opportunity to extort payments. Other studies have shown that these roadblocks play just as significant a role in the local economy as the mining of minerals. The IOB institute in Antwerp recently calculated that the Penge roadblock on the road to the Muchacha site generates up to 1,000 USD per day.<sup>36</sup>

In the first seven months of 2022, 56 out of 112 reported incidents on the Kufatilia platform (50 %), of which all were located in the area covered by P-DEC, were identified as acts of violence or theft. The IPIS partner organizations in Kufatilia listed these 56 incidents into sub-categories (Table 2).

**Table 2: Types of violence reported on the Kufatilia platform in the area covered by P-DEC between January and July 2022.**

Type of violence	Number of incidents (January-July 2022)
<b>Armed groups (incursion, presence, violence)</b>	12
<b>Theft and pillaging</b>	12
<b>Torture and/or degrading treatment</b>	12
<b>Sexual violence</b>	7
<b>Fights between local mining actors</b>	4
<b>Abduction</b>	4
<b>Expropriation</b>	3
<b>Other</b>	2
<b>Total</b>	56

In 11 of the 56 incidents that involved violence, undisciplined FARDC elements or members of the judiciary police were identified as the culprits. In the one incident involving the creation of an illegal roadblock, undisciplined FARDC elements were accused of beating up a driver who refused to pay a levy. Informers who use the Kufatilia platform have also reported direct or indirect acts of violence perpetrated by the on-site Chinese companies: three reported incidents of expropriation of artisanal miners were carried out by Chinese expatriates. In another case, Chinese companies were accused of supporting armed groups in exchange of protection in order to extract gold.

36 Verweijen et al., Conservation, conflict and semi-industrial mining: the case of the eastern DRC, Analysis and Policy Brief n°49, University of Antwerp, 2022, p. 5

## 4. EXTRACTION OF MINERALS IN THE OWR: AN ECOLOGICAL DISASTER

Revised in 2018, Article 6 of the Mining Code states: mining or quarry rights cannot be granted in a protected area nor can an artisanal operation zone be set up. Article 3bis defines a protected area as: “a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means...”.<sup>37</sup>

And yet Map 3 shows mining titles granted to Chinese company Kimia Mining within the OWR according to the 1992 delimitations. If the new OWR boundaries published on the DRC Mining Cadastre portal are taken into account, the reserve’s area appears considerably reduced. We subsequently note that the mining titles for Kimia Mining, Ratel Metal Congo SARL and MCC Resources SARL are located within the OWR. The sites in which Kimia Mining exploits gold in a semi-industrial manner, under the protection of the 31st FARDC Brigade, are precisely located in these mining concessions. The machines used by the

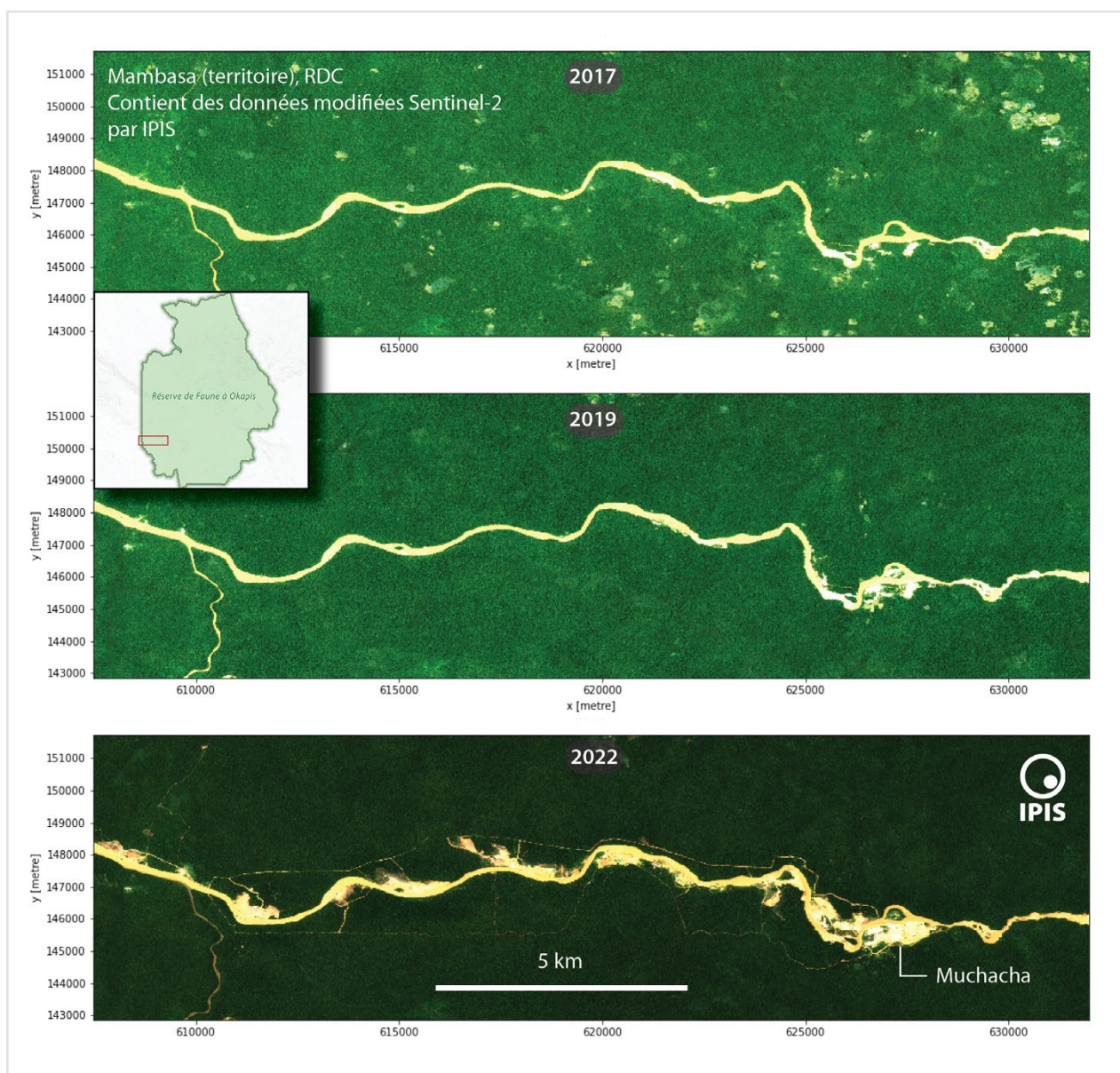


Figure 3: Mining operations along the Ituri river in the OWR and changes between 2017 and 2022 (yearly composite images based on Sentinel-2 data).

37 Articles 3bis and 6 of the March 28, 2018 revised Mining Code, pp. 3 and 9.

Chinese company have caused the displacement of the river bed. Images from the Sentinel-2B satellite (Figure 3) show how mining operations along the Ituri river have evolved over five years, and how the riverbed has consequently been diverted and has widened over time.

The local population has observed the environmental destruction caused by mining activities. 20 out of 112 incidents reported between January and July 2022 on the Kufatilia platform and within the P-DEC's area of study, are linked to environmental destruction. Local users have denounced deforestation (eight incidents), the use of mercury (five incidents) and river pollution (seven incidents) caused by the extraction of minerals. In nine incidents (47 % of incidents linked to environmental destruction), the informer directly blames a Chinese mining company. Furthermore, three reports describe accidents (sometimes fatal), some of which involve children in abandoned and water-filled pits. This raises the issue of how mining sites no longer in use are managed. Finally, a Kufatilia informer questioned the impact of mineral extraction on the quality of water: **“We have observed that clean drinking water is a problem in the Mukulungu mining camp, at an hour’s walk from Badengaido village. As a result, people are forced to buy 30-ml water bags that cost 1,000 CDF.”**<sup>38</sup>

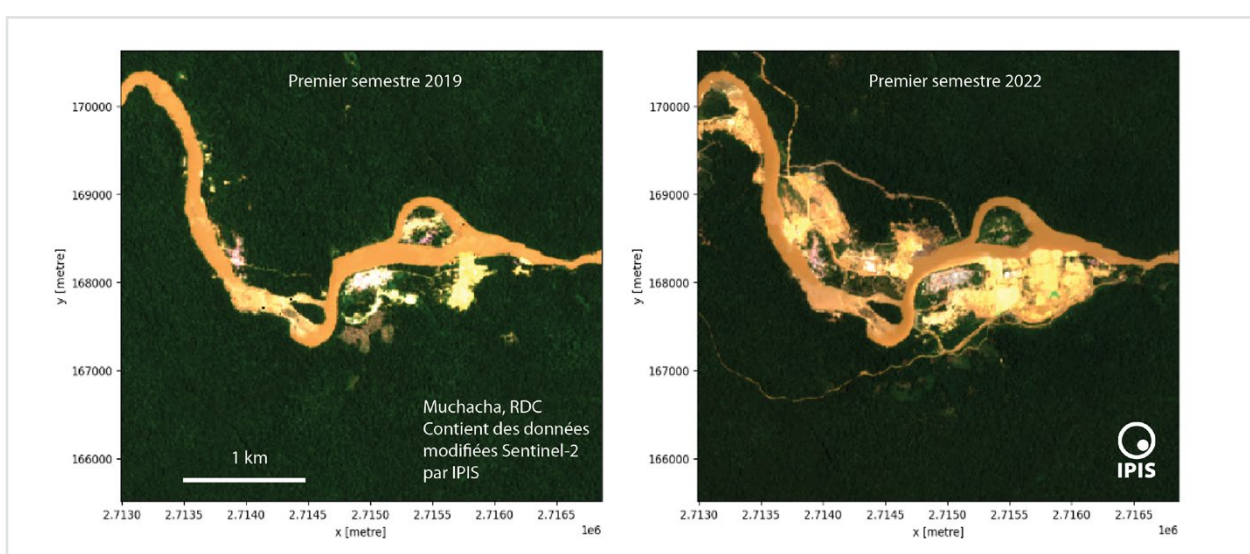


Figure 4: Mining operations at the Muchacha site and surrounding areas, and changes between 2019 and 2022 (semi-annual composite images based on Sentinel-2 data). IPIS estimates a loss of forest cover of approximately 260 ha between both images.

38 Kufatilia incident No.18619, sent on March 29, 2022.

## 4.1. Exploitation of timber in the OWR

Prior to excavation operations, the extraction of gold in western Mambasa begins by clearing the land, in other words, deforestation. Deforestation was observed in 88 % of visited sites (36 out of 41 sites). This practice is increasing given that artisanal miners expand their area of extraction as soon as a pit is seen as not profitable enough. Deforestation is exacerbated by the use of timber for multiple human activities, observed in all mining sites: cooking (40 sites), mine infrastructure (40 mines), wood boards (31 sites) and transformation into charcoal (24 sites).



*Masukumani mining site.*

## 4.2. Use of mercury

The Democratic Republic of the Congo did not sign the Minamata convention<sup>39</sup> which aims to protect human health and the environment against the hazardous effects of mercury by reducing, and if possible eliminating the metal from operations pertaining to the extraction and artisanal small-scale transformation of gold.<sup>40</sup> The Congolese Environmental Agency estimates that artisanal mines emit between three and four and a half tons of mercury into the environment every year.<sup>41</sup> According to the agency, the use of mercury in DRC artisanal mines has been observed mainly in Ituri and South Kivu.<sup>42</sup> According to data regarding mercury, collected by IPIS since 2019, amalgamation is more common in

39 Congolese Environmental Agency, National Action Plan to reduce, and if possible to eliminate, the use of mercury in artisanal and small-scale gold extraction operations (EMAPE) in the Democratic Republic of the Congo (DRC), Kinshasa, February 2020.

40 Minamata Convention on Mercury: text and appendixes, United Nations Program for the Environment, September 2019.

41 Congolese Environmental Agency, National Action Plan to reduce, and if possible to eliminate, the use of mercury in artisanal and small-scale gold extraction operations (EMAPE) in the Democratic Republic of the Congo (DRC), Kinshasa, February 2020, p. 9.

42 Ibidem, p. 17



Ituri than in other provinces. Although mercury is used in 50 % of artisanal gold mines in Ituri (43 out of 85 sites),<sup>43</sup> this statistic greatly decreases in other gold-producing provinces: mercury is used in 28 % of artisanal mines in Maniema (21 sites out of 73), 24 % in North Kivu (41 out of 170), and 21 % in South Kivu (37 out of 174).

In the sites visited for the P-DEC project, IPIS observed that gold is amalgamated with mercury in 92 % of artisanal mining sites to the west of the OWR (38 out of 41 sites). This demonstrates a more intensive and higher use of mercury in comparison with other sites in the Ituri Province. Mercury is a serious hazard to human health and to the environment, particularly since it is used without precaution. Mercury is manipulated in an isolated location in only one site. Otherwise, it is used at approximately 20 meters from the nearest houses, near the river (36 artisanal mining sites out of 41), on site (16 out of 41), in sales locations (10 out of 41) or in artisanal mining camps (8 out of 41).<sup>44</sup> Furthermore, in nine sites out of 41, the amalgamation of gold with mercury is done by children. Inhalation and exposure to mercury can have adverse effects on the nervous system, the kidneys, the skin, the digestive system, the heart, the immune and endocrine system, the respiratory system and the eyes.<sup>45</sup> Mercury in water and sediments is the primary concern, as it is in a highly toxic form and can easily be taken up by animals, thus finding its way into the human food chain.<sup>46</sup>



*Site aurifère artisanal « Kputuka ».*

43 [https://ipisresearch-dashboard.shinyapps.io/open\\_data\\_app/](https://ipisresearch-dashboard.shinyapps.io/open_data_app/). To obtain precise data, we filtered the gold mining sites visited by IPIS between January 1, 2019 and April 7, 2022 (latest update).

44 Mercury may possibly be used in different locations. This explains a total higher than 41.

45 Canadian Center for Occupational Health and Safety, June 14, 2019. [https://www.cchst.ca/oshanswers/chemicals/chem\\_profiles/mercury/health\\_mercury.html](https://www.cchst.ca/oshanswers/chemicals/chem_profiles/mercury/health_mercury.html)

46 European Environment Agency, Mercury: a persistent threat to the environment and people's health, September 2018, <https://www.eea.europa.eu/articles/mercury-a-persistent-threat-to>

### 4.3. Poaching

In 56 % of artisanal mining sites (23 out of 41), bushmeat from poaching is sold in several restaurants in which artisanal miners eat. Monkeys are the most commonly hunted species by poachers. Monkey meat is found on all mining sites (23 sites) where smoked meat is consumed. Other animals include: duikers (small antelopes; 20 sites out of 23), snakes (10 sites), bush pigs (same family as the boar) (9 sites), African brush-tailed porcupine (8 sites) and pangolins (2 sites) (Figure 5). Among the poached animals, several species of chimpanzees, pangolins and duikers have been listed as endangered species by the International Union for Conservation of Nature (IUCN).<sup>47</sup>

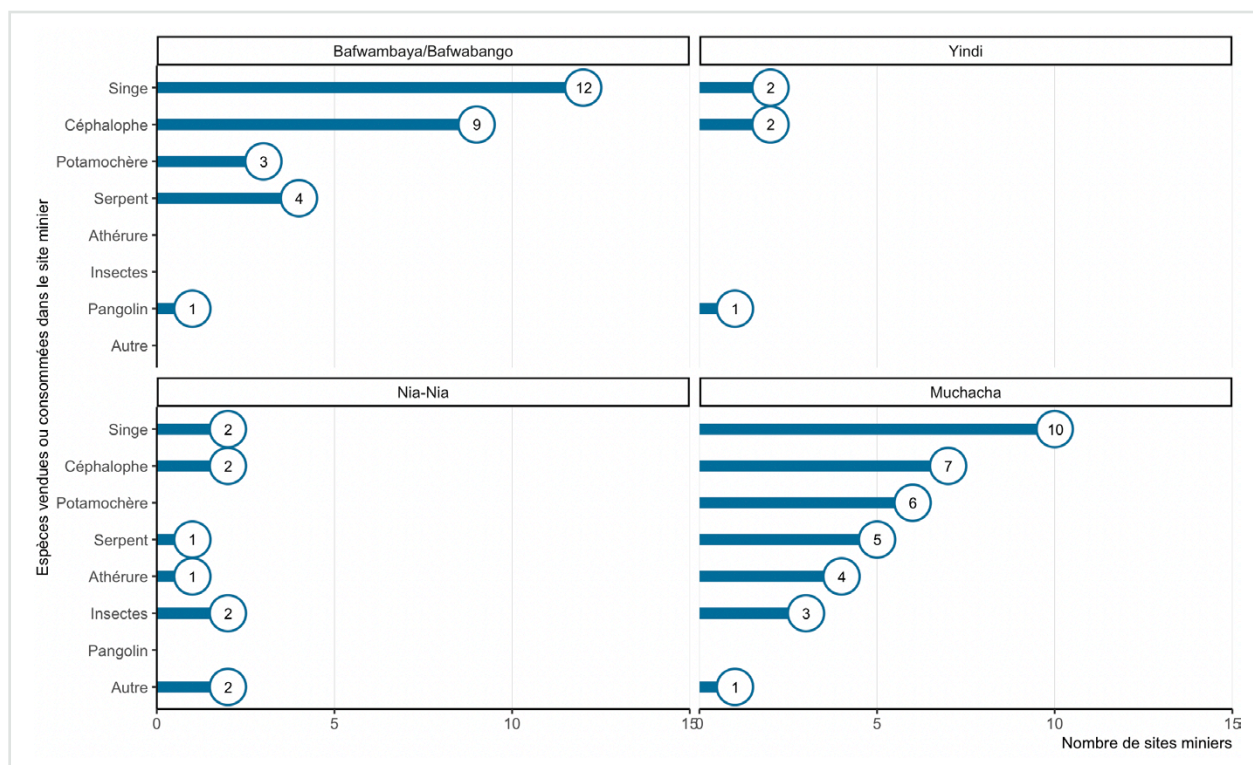


Figure 5 : Espèces animales vendues ou consommées dans les sites miniers par zone d'étude (hors animaux domestiques).

There is not a typical poacher profile. They could be nearby villagers, artisanal miners, pygmies living in the forest, or even locally stationed FARDC soldiers. It has been observed that the Mai-Mai Mangaribi poach to survive. They also sell bushmeat at mining sites, which gives them the opportunity to secretly monitor the progress of extraction operations, the equipment used, the number of armed men present, etc. Poachers eat the animals they hunt and/or sell the meat. On rare occasions, animals are killed for their hides or teeth, used for ornamental purposes or for their magical properties (1 site out of 23). Some anecdotal observations tend to prove that consumption of bushmeat is higher than meat from farmed animals (cows, goats, chickens, etc.) Bushmeat is more accessible than farmed meat in mining sites within the OWR (the largest sites). Miners also say they prefer smoked bushmeat over farmed meat. Although bushmeat is relatively expensive, hunters accept gold as barter. Many village farmers keep their stock of farmed animals for special occasions (dowries, weddings, funerals), and practice poaching for their daily meat consumption. Smoked bushmeat is also in demand in villages further away from mining sites and from forests. As a result, poaching and selling animals has become the main source of revenue for some village farmers.

47 IUCN Redlist: <https://www.iucnredlist.org/search?taxonomies=105873&searchType=species> (consulted June 6, 2023).



*"Paradis" mining site, Bandaka groupement.*

## 5. FORMALIZATION OF ARTISANAL MINING

### 5.1. Government services

Prior to the visit by IPIS, government services had visited 50 % of mining sites (20 out of 41) at least once in the past six months. All these sites are located in the same area: to the north, in the Bafwambaya and Bafwabango groupements, and to a lesser extent in the area surrounding Yindi. No government service was observed in mining sites within the OWR and in sites south of Nia-Nia, along the Ituri river.

When mining sites are visited by government agents, numerous services take advantage of the occasion to enter sites illegally and charge illegal fees. In fact, IPIS investigators reported the presence of 19 government services (Table 3) on sites

Name of government service	Number of sites at which they were seen
<b>Mining authority</b>	20
<b>SAEMAPE</b>	20
<b>Chieftaincy</b>	20
<b>Environment</b>	16
<b>Energy</b>	11
<b>DGI</b>	11
<b>ANR</b>	9
<b>DGRPI</b>	8
<b>Economic affairs</b>	4
<b>Tourism</b>	3
<b>Sector</b>	3
<b>DGM</b>	3
<b>Afridex</b>	2
<b>Military audit office (B2)</b>	1
<b>Culture and Art</b>	1
<b>FFN</b>	1
<b>Mining group</b>	1
<b>PMH</b>	1
<b>Hygiene</b>	1

**Table 3: Government services present at mining sites in western Mambasa (June-July 2022)**

An average of six government services visited sites located between Bafwambaya and Bafwabango, and nearly five in the area surrounding Yindi. In eight out of 20 sites in which the presence of government services was observed, up to eight government services charged money from artisanal miners. According to the law, only the Mining Division and the SAEMAPE (or the PMH in the event of conflict) are authorized to inspect mining sites.<sup>48</sup> This shows an abuse of authority by government agents. The presence of the National

<sup>48</sup> DRC Mining Ministry and Finance Ministry, Manual of procedures for the traceability of mining products: from extraction to export, 2nd edition, September 2014, p. 12

Intelligence Agency (ANR) at 45 % of sites (9 out of 20) suggests that government authorities want to prevent the resurgence of Mai-Mai since control was recently regained in the region. Miners, however complain about intimidation and demands for money by ANR agents.

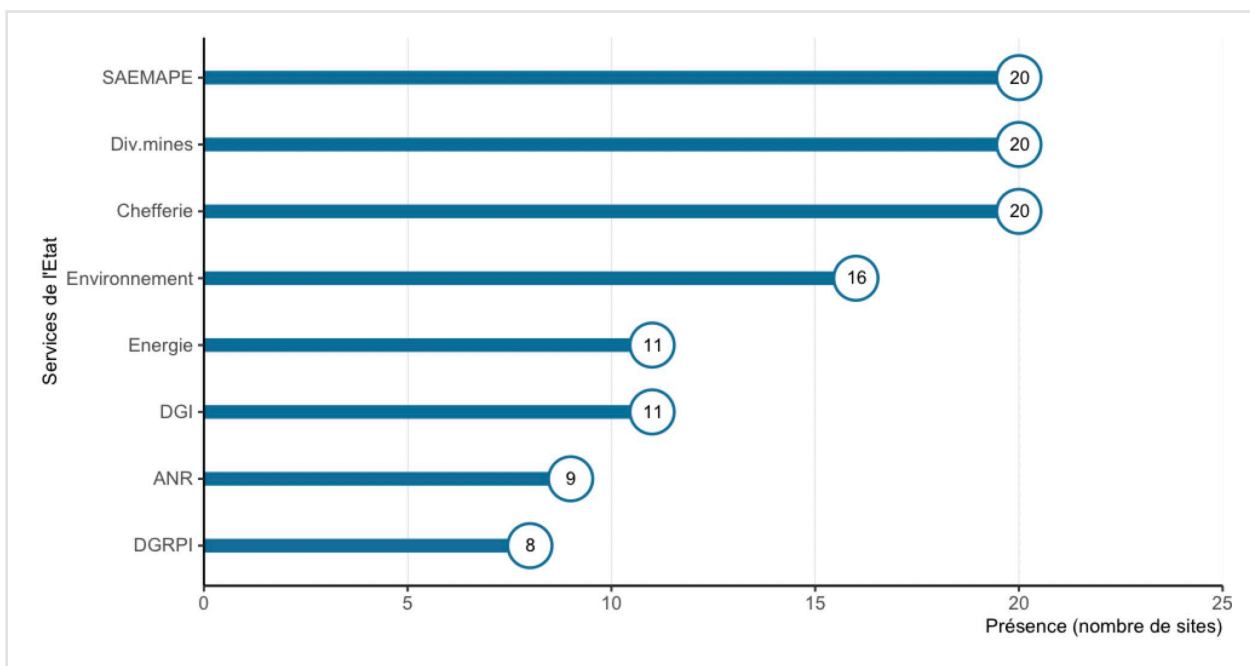


Figure 6: Presence of main government services at mining sites in western Mambasa (presence at the 41 sites visited, in the six months prior to the visit of IPIS teams).

The SAEMAPE and the Mining Division are present at the same 20 sites (Figure 6). Visits are often monthly (12 sites out of 20). Certain sites that are nearer and more productive have increased surveillance (several times per week in four sites; every day in one site). Overall, the Mining Division and the SAEMAPE are not well regarded by artisanal miners due to frequent administrative harassment and the SAEMAPE's lack of assistance. Government agents do not have access to Kimia Mining sites. This fuels suspicions of connections between senior army officers and the Chinese company, as mentioned in section 3.1. According to on-site testimonials, Kimia Mining executives go to Bunia themselves to negotiate with provincial government services. Another site is controlled by the Mai-Mai Asomba Liwa armed group, which does not grant access to government agents.

## 5.2. Cooperatives

IPIS investigators identified 20 mining sites with at least one cooperative. The first one, Ngayo Congo Mining Cooperative (CMNC), manages seven sites in the Ngayo groupement. According to the Technical Cell for Coordination and Mining Planning (CTPCM) website, the cooperative was created in 2016, but we are not aware if the CMNC received its provincial (Avis favorable) or national approval (Agrément de coopérative Minière).<sup>49</sup> The second one is the Bafwabango Mining Cooperative (COMIBA). We did not find documents attesting to an avis favorable or ministerial decree stipulating its approval as a Mining cooperative. It manages 13 sites spread across groupements in the northeast area of the province, between Bafwabango and Bafwambaya. Its new Mining Cooperative prompted positive comments from members who noted the cooperative's capacity to avoid hassles from government authorities and ensure security at mining sites. Negative comments include stating that the cooperative is simply a pawn for the mining site administrator (AFM) to better control and elicit money from miners. This comment suggests a latent conflict between the AFM and artisanal miners. Parties blame each other

49 <http://www.e-mines.ctpcm.cd/detailsope/698727/details/#> (consulted June 7 2023). Provincial approval, Avis favorable, is usually given by the province prior to national approval, the Agrément minier, which itself is set forth according to a decree from the Ministry of Mines in Kinshasa

for not complying with agreement clauses (documents are signed but have no legal value). The AFM has also been known to dismiss artisanal miners when pits become particularly productive. At the request of artisanal miners, the FARDC, the Mambasa Military Audit Office or the PNC have attempted to deal with complaints, but their mediation practices are tainted with corruption.

Both cooperatives operate since 2018 but are not yet registered with the SAEMAPE. Moreover, the number of members is very limited: 28 at the COMIBA and 11 at the CMNC. This suggests that these cooperatives simply have an official name but do not undertake concrete activities on behalf of artisanal miners. This explains the lack of relations, negative or positive, between artisanal miners and cooperatives.

### 5.3. Digging permits

Mining regulations state that artisanal miners must have a artisanal mining licence (carte de mineur artisanal). Licences are valid for one year, cost 15 dollars and are delivered by the Mining Division. Miners with digging permits are present on 24 out of 41 sites. We estimate that 2,200 artisanal miners, about 16 % of the labor force, have a digging permit; 750 artisanal miners who have a digging permit (35 %) work on the same mining site of Libreville (run by COMIBA).

### 5.4. Mine status

To be legal, artisanal mining operations must be on an artisanal mining zone (ZEA),<sup>50</sup> or on a concession with a Research Permit (PR) and written consent from the mining title owner.<sup>51</sup> Thirteen out of 41 sites visited were not located within a concession; 28 were located in concessions that belong to mining companies (see Map 1).

Sixteen mining sites within the Bandaka chieftaincy are located in the KGL-Somituri concession (KGL-Société Minière de l'Ituri, PE9691); the majority shareholder is Canadian mining company Kilo Goldmines Inc., and the Congolese government owns 5 % of shares.<sup>52</sup> The concession includes 13 sites managed by the COMIBA cooperative and two by the CMNC cooperative. There appears to be no conflict between KGL-Somituri and artisanal miners.

The aforementioned Chinese company Kimia Mining Investment SARL already holds nine research permits (PR 13 269, PR 13 270, PR 13 271, PR 13 272, PR 14 623, PR 14 624, PR 14 625, PR 14 717 and PR 14718) along the Ituri river, along the Nia-Nia road running east-west, in Penge, and Epini. As mentioned earlier, relations between artisanal miners and the Kimia Mining company are conflictual. It is worth noting, however, that according to the Mining Cadastre, some of the disputed sites (including Muchacha) are not located on Kimia Mining concessions but rather on those of MCC Resources SARL, owner of mining title PR 7657, delivered November 10, 2020 and valid until 2045.<sup>53</sup> To the south of PR 7657, the Ratel Metal Congo SARL company has received two small-scale mining permits (PEPM) within the OWR (PEPM 8348 and 8350).

---

50 Art. 109 of the Mining Code, Journal Officiel de la République démocratique du Congo, March 28, 2018

51 Art.30 littéras e of the Mining Code, Journal Officiel de la République démocratique du Congo, March 28, 2018

52 [https://congominer.org/drc\\_companies/215-kgl-societe-miniére-de-l-ituri#](https://congominer.org/drc_companies/215-kgl-societe-miniére-de-l-ituri#), reviewed March 3, 2023.

53 Mining Cadastre of the Democratic Republic of the Congo, Registry of valid mining and quarry rights as of July 1, 2021, p.22. [https://cami.cd/wp-content/uploads/2021/07/REGISTRE-DES-DROITS-MINIERS-ET-DE-CARRIERES-VALIDES\\_JUILLET2021.pdf](https://cami.cd/wp-content/uploads/2021/07/REGISTRE-DES-DROITS-MINIERS-ET-DE-CARRIERES-VALIDES_JUILLET2021.pdf)

Artisanal miners at three sites in the Loncor Resources Congo SARL concession (PR 1803) are not aware that the research permit expired on February 9, 2022.<sup>54</sup> Conversely, according to the CAMI, 16 sites located in the area between Bawfabango (km marker 51) and Bafwanakengele (km marker 25) are part of the Adumbi Mining SA concession (PE 9691) of which Loncor Resource Inc. is the majority shareholder<sup>55</sup>. According to our investigators, miners from these 16 sites do not recognize Loncor Resources as the legal concession owner.

Finally, the only site located in a ZEA (ZEA 481) is abandoned, as manual dredging no longer produced gold.<sup>56</sup> Artisanal miners often criticize the practice of moving sites to ZEAs. They worry that gold is insufficient in the areas allotted to them. Unfortunately, the previous example is proof that they are right. It is vital to conduct geological research in the locations that artisanal miners are moved to. At best, risks entail setting up new mining sites without results; at worst, artisanal miners may react violently and go back to the zones they were evicted from.

---

54 *ibid.*, p.10.

55 Loncor holds 84.68 % of shares; the Congolese government holds 10 %; 5.32 % belongs to various shareholders. Loncor Gold Inc., Loncor Increases Interest in Adumbi Mining to 84.68 %, Announcements, Toronto, September 2020, <https://www.loncor.com/media1/announcements/2020/item/81-loncor-increases-interest-in-adumbi-mining-to-84-68-percent>

56 Given that the site is abandoned, we did not include it in our various estimates. We restricted our sample to 41 active mining sites.

## 6. PRODUCTION, TYPES OF OPERATIONS AND WORKING CONDITIONS

### 6.1. Production

Estimating production by artisanal miners is a difficult task for IPIS and for other artisanal mining specialists. Site managers and pit managers are not accustomed to keeping production records. Most site managers refuse to share their data or share minimal information; they are afraid of being subject to charges or administrative hassles. There is no reliable system to report statistics from points of sales and statistics are often dramatically lowered in order to reduce taxes calculated in proportion to production results.<sup>57</sup>

It was difficult to find reliable sources capable of estimating Kimia Mining's production within our area of study. Investigators reported three to seven kg per week (depending on the season) at the Muchacha site inside the OWR. Verifying these figures in February 2023, on-site contact persons now report three to five kg per week (dry sea

Overall, we believe that particularly high production is likely due to the mechanization of operations. Conversely, in other eastern Congo regions, IPIS most often observed low or very low mechanization and equipment levels. In the majority of P-DEC sites, investigators reported mechanization levels that were high (27 out of 41), or average (13 out of 41).

In the northernmost area, in the Bombo and Bandaka chieftancies, almost all mining sites are equipped with jackhammers (15 out of 17), generators (14 out of 17) or rock crushers (13 out of 17). Further south, within the OWR, mining sites are equipped with dredges (3 sites), as well as excavators and dump trucks in eight Kimia Mining sites (Photo 1).

In fact, some of these mines, particularly those run by Kimia Mining, should be considered semi-industrial mines rather than artisanal sites.

Gold extracted from mines in the western Mambasa territory is sent mainly to larger cities such as Butembo (28 out of 41), Bunia (26 out of 41) and Kisangani (17 out of 41). It may transit through local trading centers (Nia-Nia, Isiro). It is the traders or middlemen who travel to mining sites to buy the gold.

### 6.2. Types of operations

The majority of artisanal operations in western Mambasa are underground galleries in which miners follow a seam (24 sites out of 41). In open-pit mining sites (20 sites out of 40), a team of artisanal miners (eight or ten-person work groups, known as "écuries") dig vertically and bring up soil to be washed and panned for gold. Most of these (18 out of 20), are alluvial pits in which gold has been deposited by the force of water and are found near watercourses. Two are eluvial (the gold is disintegrated in the rock). The median number of pits on a site is five. One particularly large site contained 130 pits.

According to the Mining Code, a pit cannot be deeper than 30 meters. Artisanal miners seem to comply with this rule. Pit depth is an average of nine meters (322 pits); only one pit exceeded the authorized depth. In five Kimia Mining sites, artisanal miners who were run off by the company come back to wash tailings, the dirt and debris left over after deeper digging and which have already been washed and processed once. Seven dredges were observed along the Ituri river within the OWR in three out of five sites run

---

57 G. de Brier et al. Taxes and charges on artisanal mining sites in South Kivu and Ituri, IPIS, Antwerp, April 2023.



by Kimia Mining. Although it is impossible to calculate the amount of gold collected by dredges, it is important to note that such machines are particularly productive. A 2015 COSOC-GL study in Shabunda (South Kivu) showed that 175 suction dredges and four industrial conveyor-belt dredges produced 660 kilos of gold per month.<sup>58</sup>



*Mopa gold mining site, Bafwambaya groupement.*

### 6.3. Working conditions

Artisanal miners work an average of six days per week during the dry season and five days per week in the rainy season. Some sites operate every day (12 out of 41 during the dry season and six during the rainy season). At most mining sites, work is carried out without protective equipment (26 out of 41). A minority of artisanal miners at a few sites wore shin guards (12 out of 41 sites). High work pace, significant use of machinery and lack of protective equipment create a hazardous work environment. According to numbers provided by managers of artisanal mining sites, there were 239 accidents at 11 sites in the six months prior to the visit by IPIS investigators. Furthermore, 347 artisanal miners were seriously injured and eight miners died. The OWR Muchacha mining site alone accounts for 180 accidents and 230 injuries, estimates of 75 % and 69 % respectively.

The Kufatilia platform reported 20 accidents linked to mining extraction in P-DEC's area of study between January 1 and July 31, 2022: five incidents mentioned a collapsed pit or a landslide that caused two deaths and five injuries. Four incidents pertained to the death by asphyxiation of one or several artisanal miners in a pit (eight victims). Other reports of injured artisanal workers involve the use of rock crushers or the lack of protective equipment.

The majority of artisanal miners are paid in-kind according to the mine's production (29 sites out of 41); a minority is paid in cash (9 sites out of 41). The two payment methods coexist in three sites.

---

58 COSOC-GL, Study of gold dredging in Shabunda: the gold rush in Shabunda, July 2015, p. 2

## 7. RECOMMENDATIONS FOR THE P-DEC PROJECT

### 7.1. Areas of intervention

The report showed that areas where mining extraction operations are the most intensive are to be found within the protected OWR, which is prohibited by mining regulations.<sup>59</sup> The report also shows that the presence of machinery and Chinese personnel from Kimia Mining has transformed artisanal gold extraction into semi-industrial operations that have consequences on the environment, the region's stability and working conditions. The diversion of rivers from their natural beds, the use of mercury, and the loss of forest cover are serious environmental concerns. Furthermore, the presence of the Chinese company is a source of instability in the region given that it "recruits" undisciplined elements from regular army units in order to protect its equipment and its operations, and to chase off artisanal miners. There is a worrying possibility that two government entities, the FARDC and the ICCN, made up of individuals who are authorized to carry weapons, might clash in order to enable or to prohibit the extraction of gold in the OWR. The use of official armed actors, in particular regular army units which are meant to protect Congolese citizens, engenders frustration and fuels violent confrontations between local populations and the FARDC. Finally, the report demonstrates the poor working conditions of artisanal miners. This is especially true in mines within the OWR, where the vast majority of reported accidents took place (see section 6.3).

There are two options to convince artisanal miners to leave the OWR. The first is to recommend other gold mining areas, which could be turned into ZEAs. An initial relocation could be made to the northernmost region between Bawfabango (km marker 51) and Bafwanakengele (km marker 25), where we observed a large work force, meaning high production. Moreover, investigators reported this part of the territory as stable. A second possible area is south of Nia-Nia. Fewer sites were visited but production estimates suggest that there is enough gold for additional artisanal miners. Investigators also reported this area to be stable, secure and calm. The second option for artisanal miners leaving the OWR is to take up and develop other revenue-generating activities.

IPIS recommends three potential zones in which P-DEC project implementers can develop such activities and reinforce peace: first, the OWR, in order to put a stop to artisanal mining, secondly the zone between Bawfabango (km marker 51) and Bafwanakengele (km marker 25), and finally the zone south of Nia-Nia, to accommodate the artisanal miners leaving the OWR, but also to develop the area's economic infrastructure and stability.

### 7.2. Actions to undertake

To have an impact on the region's stability, local, national and provincial advocacy initiatives are necessary in order to put a stop to Kimia Mining's activities in the OWR and to demand mining site rehabilitation at the expense of the company. P-DEC will be a means to encourage the area's currently active artisanal miners (at least 6,000 according to our estimates) to relocate by providing income-generating activities. For those who wish to continue working as artisanal miners, it is necessary to support their integration into other mining sites and to find ways to incite "host" sites to accept newcomers. We also recommend the formalization of mining sites in both zones of activity. This entails creating or supporting existing cooperatives, particularly in their effort to obtain ZEA status or written consent from the mining title holder. Formalization also involves requesting an official "blue mine" status. The new artisanal mining qualification was approved by inter-ministerial order No. 0677 on November 12, 2021. Sites must be listed on the register of the local mining authorities, which will then send a blue mine qualification request to

---

59 Art.3 Chap.2, Mining Regulations Handbook Decree No.38, March 26, 2003. Journal Officiel de la République démocratique du Congo, Kinshasa, June 12, 2018.

the provincial ministry. Cooperatives and mine operators may request a listing on this register.<sup>60</sup> Once sites are listed, exporters must conduct an evaluation mission to determine the risks associated with sites classified as yellow or red, and send a report to the provincial mining authorities. If no risks are reported and the mining authorities have not set forth any objections within ten days, exporters are authorized to use the site as a supplier. The site is then listed as “blue”.<sup>61</sup>

To put an end to the FARDC’s protection of Kimia Mining’s operations, P-DEC must conduct advocacy initiatives among the army’s highest command to ensure that current undisciplined Brigades are replaced by new troops. These troops could then be trained in environmental protection with a focus on the vital importance of the OWR.

P-DEC needs to offer revenue-generating activities for artisanal miners leaving the OWR who wish to work in other sectors. Observed in at least five sites, the consumption of insects could provide a partial solution to the poaching problem. The FAO has recommended entomophagy for its benefits to the environment (low emissions of greenhouse gases; insects eat organic waste and are less dependent on soil types than traditional livestock), and to human health (source of protein, fiber and trace elements; low risk of transmitting zoonotic infections to humans).<sup>62</sup> In-depth studies of the economic sustainability of such a business activity have not been conducted. The FAO, however, has stated that the investment required to gather insects and to purchase insect farming equipment is minimal.<sup>63</sup> A feasibility study of the development of insect farming could determine if it is a viable revenue-generating activity. Other activities to consider are livestock and poultry farming. It would be a good idea to value other business activities by artisanal miners that are non-detrimental to the environment, such as the production of honey.

We also recommend that P-DEC combine its initiatives in one area in order not only to focus on the artisanal mining sector, but to take a holistic approach to the region’s development. For example, to combat child labor, it is necessary that other P-DEC project implementers set up appropriate measures to support and educate children. This will require P-DEC project partners to work hand in hand and to coordinate their activities.

Finally, an internal IPIS study for P-DEC identified contract breaches between the AFM and artisanal miners as an important cause of instability in the western Mambasa region. Creating and supporting conflict resolution mechanisms between both parties will foster trust and peaceful relations, and thus consolidate stability in the western Mambasa region.

---

60 Article 5 of Inter-ministerial order No. n°0677/CAB.MIN/Mines/ANSK/01/2021 which sets forth procedures to determine the status of mines that produce gold, tin, copper, cobalt, and colored gemstones in the Democratic Republic of the Congo, Mining Ministry, Kinshasa, November 12, 2021.

61 Article 8 of Inter-ministerial order No. n°0677/CAB.MIN/Mines/ANSK/01/2021 which sets forth procedures to determine the status of mines that produce gold, tin, copper, cobalt, and colored gemstones in the Democratic Republic of the Congo, Mining Ministry, Kinshasa, November 12, 2021.

62 FAO, *The Contribution of Insects to Food Security, Livelihoods and the Environment*, April 2013. <https://www.fao.org/edible-insects/en/>

63 *ibid.*, p.1.

## BIBLIOGRAPHY

Agence Congolaise pour l'Environnement, Plan d'Action National pour réduire, et si possible éliminer l'utilisation du mercure dans l'extraction minière artisanale et à petite échelle de l'or (EMAPE) en République démocratique du Congo (RDC), Kinshasa, Février 2020.

Agence Européenne pour l'Environnement, Le mercure : une menace persistante pour l'environnement et la santé des citoyens, Septembre 2018.

Centre Canadien d'Hygiène et de Sécurité au travail, le 14 juin 2019.

Centre du Patrimoine mondial, UICN, Rapport de mission : Mission de suivi réactif de la Réserve de Faune à Okapis, République démocratique du Congo (RDC), mars 2014.

Code Minier révisé du 28 mars 2018, Journal Officiel de la République démocratique du Congo, Kinshasa, le 28 mars 2018.

Congo Profond, Environnement : l'ICCN fait toujours confiance en son partenaire WCS et menace de traduire ses détracteurs en justice, 17 novembre 2022, <https://congotprofond.net/environnement-liccn-fait-toujours-confiance-en-son-partenaire-wcs-et-menace-de-traduire-ses-detractions-en-justice/> .

Convention de Minamata, sur le mercure : texte et annexes, Programme des Nations Unies pour l'Environnement, Septembre 2019.

COSOC, La ruée vers l'or à Shabunda, Pratiques et impacts de l'exploitation minière par dragues, Juillet 2015.

Election et, Ituri, Incursion de miliciens dans un carré minier à Mambasa, 20 février 2022, <https://www.election-net.com/article/ituri-incursion-des-miliciens-dans-un-carre-minier-a-mambasa>.

FAO, La contribution des insectes à la sécurité alimentaire, les moyens de subsistance et l'environnement, Avril 2013, <https://www.fao.org/edible-insects/fr/>.

G. de Brier et T. Muller, Taxes et prélèvements sur les sites miniers artisanaux dans le Sud Kivu et en Ituri, IPIS, Anvers, Avril 2023.

G. de Brier et H. Merket: Artisanal Gold Monitoring Pilot in Mambasa, Ituri, Monitoring report, IPIS, Antwerp, September 2017.

G. de Brier, Rapport quantitatif de la mission IPIS pour le projet Madini dans le groupement de Ngandja (Misisi), territoire de Fizi (Sud Kivu), IPIS, Anvers, Juin 2022.

Groupe d'Experts des Nations Unies pour la RDC, S/2016/1102.

Groupe des Experts des Nations Unies pour la RDC, S/2022/479.

Hansen, et al. High-resolution global maps of 21st-century forest cover change., Science, 342.6160, 850-853, 2013:

IKV Pax Christi, Analyse de contexte de l'Ituri, Janvier 2009.

J. Verweijen et al., Conservation, conflict and semi-industrial mining: the case of the eastern DRC, Analysis and Policy Brief n°49, University of Antwerp, 2022.

Loncor Gold Inc., Loncor Increases Interest in Adumbi Mining to 84.68 %, Announcements, Toronto, Septembre 2020,

<https://www.loncor.com/media1/announcements/2020/item/81-loncor-increases-interest-in-adumbi-mining-to-84-68-percent>

P. Schouten, Exploiter (dans) le désordre : Cartographie sécuritaire du secteur aurifère à Mambasa occidentale, PAX, September 2015.

RFI, Mort du chef Mai-Mai Morgan : que s'est-il passé à Molokai ? RFI, 5 mai 2014. <https://www.rfi.fr/fr/afrique/20140505-rdc-mort-mai-mai-morgan-molokai-fardc-enoch-kinzambi-fall-sikabwe>

## Tools and platforms

Registre des titres et opérateurs miniers en RDC : <http://www.e-mines.ctcpm.cd/detailsope/698727/details/>

Digital Earth Africa : <https://docs.digitalearthafrika.org/fr/latest/>

[https://ipisresearch-dashboard.shinyapps.io/kufatilia\\_app/](https://ipisresearch-dashboard.shinyapps.io/kufatilia_app/) [https://ipisresearch-dashboard.shinyapps.io/kufatilia\\_app/](https://ipisresearch-dashboard.shinyapps.io/kufatilia_app/)

Agence Européenne pour l'Espace, <https://sentinels.copernicus.eu/web/sentinel/missions>

IUCN Redlist:

<https://www.iucnredlist.org/search?taxonomies=105873&searchType=species>

## Legislative texts

Loi n°14/003 du 11 février 2014 relative à la conservation de la nature.

Ministère des Mines et ministère des Finances de la RDC, Manuel des procédures de traçabilité des produits miniers : de l'extraction à l'exportation, 2ème édition, Septembre 2014

Règlement Minier. Decree No.38, March 26, 2003. Journal Officiel de la République démocratique du Congo, Kinshasa, June 12, 2018.

Arrêté Interministériel n°0677/CAB.MIN/Mines/ANSK/01/2021 du 12 novembre 2021 fixant la procédure de détermination des statuts des sites miniers des filières aurifère, stannifère, cupro-cobaltifère et des pierres de couleur de la République Démocratique du Congo, ministère des Mines, Kinshasa, le 12 novembre 2021.

Arrêté Ministériel n°045/CM/ECN/92 du 2 mai 1992 portant création et délimitation d'une Réserve naturelle dénommée « Réserve de Faune à Okapis ».

*Independent research and  
capacity enhancement  
for durable peace,  
sustainable development  
and human rights*

