

Industrial Mining and its effects on household's Livelihood in Luhwindja, South-Kivu / D.R.Congo: the Case of Banro's Twangiza Mine In Luhwindja



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DEDICATION

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ACRONYMS

DFID	Department for International Development
DRC	Democratic Republic of Congo
FGD	Focus Group Discussion
OGP	Observatoire Gouvernance et Paix
SLF	Sustainable Livelihood Framework
SLA	Sustainable Livelihood Approach
TPO	Transcultural Psychosocial Organization
AFDL	Alliance des Forces Démocratiques pour la Libération's
MGL	Minière des Grands Lacs
SOMIGEL	Société Minière des Grands Lacs
RCD	Rassemblement Congolais pour la Démocratie

ABSTRACT

Artisanal mining and mining have been considered the primary livelihood activities in Luhwindja for decades. This study sought to determine the effects of industrial mining on livelihood in Luhwindja . Due to the nature of the research, being a qualitative case study, both primary and secondary data were collected through interviews, focus group discussions, and observations to answer 5 sub-questions. A sample size of 40 respondents were selected, among which 5 were key informants of the studies and were selected using a purposive sampling method, the other 35 respondents were selected using a snowball sampling technique, triangulation method was employed while collecting data.

The study found out that the suspension of artisanal mining impacted the already vulnerable rural community of people in Luhwindja by increasing unemployment, causing a loss of income and food, and leading to a rise of student dropout rates from school. Many people made the decision to sell their assets, including their animals and property, in order to deal with these effects. While some of them were able to find new employment by reinvesting in small businesses or migrating to town to look for an alternative employment, however the most vulnerable felt like they had no other option but to turn into prostitution and theft.

This study is consistent with earlier studies on informal mining and livelihoods in Luhwindja. Additionally, it raised some helpful recommendations to TPO, which is the commissioner of the study in order to develop a livelihood strategy to support Vulnerable people in Luhwindja.

CHAPTER 1: INTRODUCTION

1.1 Introduction

This thesis was done as partial fulfillment of the requirements degree of Master in Management of Development, with a specialization in Food and Nutrition Security at Van Hall Larenstein University of Applied Sciences. This thesis was commissioned by TPO (Transcultural Psychosocial Organization) in the Province of South Kivu, Democratic Republic of Congo, and will be undertaken from July to September 2022.

This thesis is organized as follows: Chapter 1, will explain why the Research was conducted and the overview of the study, it will have the research background, the commissioner or problem owner of the Research, the problem statement, the research objective, and research questions both the main question and 5 sub-questions. Chapter 2 will be the literature review which will describe the research topic and its significance, as well as get insight into the perspectives of other authors. The reader will be informed of what will be researched through the operationalization of concepts. Then Chapter 3 the method used to collect data, as well as how the data will be analyzed, then the research plan and methods section will describe how the Research will be conducted. The Research will continue by presenting the findings and results on Chapter 4, then discuss the result and reflect on the Research on Chapter 5, The thesis will conclude with a Chapter on Conclusions and recommendations.

1.2 Research Background

Background Information on Mining

Industrial Mining and export of raw materials have been a major part of the Congolese economy since colonialism (Geenen, 2011a). Large mining concessions were managed as private domains by companies like "Union Minière" in Katanga. However, starting in the 1920s, they shifted from an overtly coercive method of government to a more paternalist model, providing workers and their families with electricity and water, education, healthcare, and recreational facilities (Hönke, 2010). Following the country's acquisition of independence in 1960, Mobutu wanted to consolidate political and economic power in the hands of the state; as a result, he nationalized several significant businesses. However, industrial production decreased in the middle of the 1970s. (Geenen, 2011a).

In 1973 a law on land ownership was introduced stating that all land belongs to the state; although Congolese are allowed to live on it the owner of the land is the government, this Law does not take into consideration the Customary Law that governs most people living in villages and remote areas (Vlassenroot, 2004). Industrial mining companies claim their right to exploit the land using a

Congolese citizens started the artisanal mineral collection at the same time as a way to deal with the deepening economic crisis. Their artisanal products were illegally exported through parallel and "informal" commerce networks, which prohibited the state from profiting from it. By the middle of the 1990s, many industrial companies were having financial issues, and the state was forced to sell off a number of concessions to private investors (Kennes, 2002).

After the wars of 1996–1997 and 1998–2003, industrial output eventually came to an end, especially in the eastern provinces, a revised Mining Code and related mining regulations were introduced by the

Kabila government in 2002. An extremely lenient tax and customs policy, swift and efficient license issuance and the guarantee of investment security were all meant to meet the primary goal of luring foreign direct investments (Mazalto, 2009).

The Code acknowledges artisanal mining as a kind of production and establishes specific "artisanal mining zones" where mining cooperatives can request permission to conduct Research. But in addition, it also says that if "a new deposit needing large-scale exploitation has been uncovered," those areas might become industrial concessions. This suggests that commercial enterprises have the authority to eventually seize control of areas used for artisanal mining, which is obviously unsettling for the artisanal miners engaged. (Geenen, 2012).

The multinational Banro Corporation, situated in Canada, was one of the first businesses to begin producing gold effectively. Because of this, Banro is a crucial case study that can help the researcher understand the effects of industrial mining on households' Livelihood in Luhwindja. The company (Banro) has exploitation licenses covering more than 2,600 km² in South Kivu, and it also has research licenses covering a far greater area. A mine called Twangiza, which is located about 40 km southwest of Bukavu, the provincial capital, was the subject of extensive research by Banro in 2005. It took six years to complete the exploration phase, which was primarily focused on the chiefdom of Luhwindja but also included the neighboring chiefdoms of Burhinyi and Ngweshe. The first gold ingot was created in November 2011.

1.3 Commissioner (Problem Owner)

TPO (Transcultural Psychosocial Organization), is the commissioner and problem owner of the study. The organization has years of experience working in different territories in DR Congo and has worked in Luhwindja for years. TPO is interested in supporting vulnerable communities due to several circumstances, among them war, conflicts, and displacement, through the promotion of appropriate emergency, early recovery, and development interventions. The findings of the Research will add to previous knowledge and will enable the organization to develop a livelihood strategy to support Vulnerable people in Luhwindja.

1.4 Problem Statement

Industrial enterprises frequently obtain legal permits and concessions issued by the Congolese government and base their claims on state legislation to legitimate their respective claims to the property, this is due to the current land tenure system in DRC that is governed by dual-land property rights— a modern law and customary law. Traditionally, the customary Law gives ownership of the land to the customs chief who distributes land to his people; most families in rural areas have been 'owning' in this sense the same land for decades and they feel that the land belongs to them and they use it either for artisanal mining purposes or for agricultural. However, the modern Law established in 1973, states that the land belongs to the state, meaning that Congolese can live on land and being given a form of land use title allowing them to live there, but they cannot own the land. Many rural communities are still astonished even today when they are told that the land that they consider to be theirs is actually not theirs in formal legislation (Geenen, 2013).

Banro gold mining was a Canadian-based company before being taken over by the Chinese (Geenen, 2020); the company received a mining permit in 2005 from the government to operate in Luhwindja. On the other hand, local communities and artisanal miners received the right to exploit the land from their customary chief since they are governed by a customary land ownership system (Hilson, 2002a). This

ambiguity between the two land ownership systems created tension between Banro gold mining and the local community in Luhwindja who were formally occupants of the land.

A survey conducted by OGP(Observatoire Gouvernance et Paix) in 2008 shows that the majority of people in Luhwindja live in agricultural production and artisanal mining and that only 1% depend on wage labor (OGP, 2008). When Banro arrived in Luhwindja, approximately 6,000 to 12,000 people depended on artisanal mining and they were all displaced from the land that they were occupying for decades. This action left local artisanal miners and farmers without any means of survival. (Klaver, 2010)

Although many studies have been made concerning the importance of industrial mining in supporting DRC's economy, very little knowledge is documented on how households' livelihoods are affected by industrial mining and the possibility of collaboration between the locals and the Industrial mining Companies. During this study, the researcher studied the nature of the pre-existing artisanal economy into which Banro had entered and how this was contributing to the household's livelihood.

This Research, based on its objectives is designed not only to add to the literature but also to inform mining policymakers, local customary Chief, and other local officials about the collaboration possibilities among locals and industrial mining companies with Banro as our case study by giving information based on which strategy can be developed by TPO (Transcultural Psychosocial Organization) to support household's livelihood in Luhwindja.

1.5 Research Aim & Objectives

This study aims to determine the effects of industrial mining on livelihood in Luhwindja.

The objectives of this study are to:

Understand the livelihood activities of people in Luhwindja and how these were affected by industrial mining.

Analyze possible collaboration between the industrial mining company (Banro) and the local people in Luhwindja to support their livelihood.

Recommend livelihood strategies that could harmonize the interests of local communities and Banro, which could be embraced to support household livelihoods in Luhwindja

1.6 Research Question:

1.6.1 Main Research Question

What are the effects of industrial gold mining on households' livelihoods in Luhwindja, South Kivu Province, DRC?

1.6.2 Sub-research questions

- 1.What were the livelihoods activities in Luhwindja, South Kivu Province, DRC, before the arrival of Banro in 2011?
- 2.What was the effect of artisanal gold mining on households' livelihoods in Luhwindja, South Kivu Province, DRC?
- 3.What is the effect of industrial gold mining on household livelihood assets in Luhwindja, South Kivu Province in DRC?

4. What vulnerabilities do households have in Luhwindja, South Kivu Province, DRC, due to industrial gold mining?
5. What are strategies in other localities that harmonize interests that could be embraced by both the local communities and the industrial gold mining company in Luhwindja, South Kivu Province, DRC?

CHAPTER 2: LITERATURE REVIEW

This chapter will describe the research topic and its significance, it will also review the existing literature on land ownership and Mining in South Kivu with a focus on the case of Banro mining in Luhwindja, which guided the researcher to develop a research methodology.

2.1 History of Mining in Luhwindja

Twangiza is located in Luwhindja Collectivity; it is considered one of the richest and most significant gold mining regions in the DRC. According to a preliminary analysis commissioned by BANRO Corporation, Twangiza is home to an estimated 2.034 million ounces (or 57 tons) of gold deposits (OGP, 2008). Since Twangiza has a long history of formal and unofficial mining operations, it is referred to as the "economic lung" for the Luhwinja collectivity (OGP, 2008:29).

Following the discovery of alluvial gold in the Mwana River, the Minière des Grands Lacs (MGL), one of the colonial mining enterprises in the DRC, began conducting regular mining operations in Twangiza in the 1950s (International Mining, 2008; Vlassenroot and Raeymaekers, 2004). BANRO Corporation, a Canadian multinational corporation that controls four mining assets, including Twangiza mining SARL, started conducting formal mining; they had a land right to exploit on 2600 square kilometers (sq. km) (BANRO, 2008).

In the eastern DRC, BANRO was first introduced in 1996, however, they did not operate because of war (Vlassenroot and Raeymaekers, 2004). BANRO's 25-year mining rights were terminated because of the war's political instability and the Alliance des Forces Démocratiques pour la Libération's (AFDL) overthrow of the Mobutu regime (AFDL), Under the charge of former President Laurent Kabila (Vlassenroot and Raeymaekers, 2004).

Then, "by means of separate transactions," BANRO "bought" 78% of the mining shares that belonged to the private mining business Société Minière du Kivu (SOMINKI).

Because of the dictatorial rule of President Mobutu's adoption of a nationalization program following independence, they were unable to continue their mining operations in the eastern DRC (Vlassenroot and Raeymaekers, 2004, BANRO Corporation, 2010, International Mining, 2008).

The Société Minière du Congo (SOMICO), a new version of SOMINKI founded by the AFDL administration in an effort to restructure the DRC's mining industry, abruptly replaced BANRO. The AFDL government owned the remaining 28% of this company's 72% stake in Twangiza mining (Vlassenroot and Raeymaekers, 2004).

SOMICO was superseded by the Société Minière des Grands Lacs (SOMIGEL) in 1998 as the Rassemblement Congolais pour la Démocratie (RCD), a rebel organisation backed by former friends of late President Kabila, moved to gain control of the mining industry in the eastern DRC. However, this new business soon found itself unable to pay a self-imposed \$100,000,000 monthly tax in an effort to

capitalize on the 2001 mineral price boom. As a result, SOMINKI, the mining concession's original owner since the 1950s, received it back in the same year (Vlassenroot and Raeymaekers, 2004).

Twangiza mining was returned to BANRO in 2003 as a result of a lawsuit brought against the DRC transitional government at the time. This lawsuit was brought by a coalition of leaders from the central government, led by President Joseph Kabila, and the three main rebel governments, including RCD, as part of a deal to end the DRC war (BANRO, 2008; Vlassenroot and Raeymaekers, 2004).

Since then, BANRO has held a 25-year renewable mining agreement that gives it a 100% interest in the Twangiza land (International Mining, 2008:10). The property owned by BANRO in Twangiza is 1160 sq. km, which is five times the total area of the Luhwinja collective, including Twangiza (183 sq. km), within its historical boundaries (OGP, 2008). It is anticipated that BANRO's formal mining will "over time, considerably contribute to local economic development and job generation" (BANRO, 2008:9).

Therefore, there is no longer any room in Twangiza for artisanal mining activity (OGP, 2008). However, it is unclear when shady mining in this region started. In the 1970s and 1980s, there was an upsurge in illegal mining activities. This was a result of an economic crisis brought on by the Mobutu Regime's nationalization of the mining industry. This policy change undermined the official mining industry and resulted in job losses.

Many people engaged in artisanal mining activities to deal with the crisis, looting and occupying the majority of the formal mining concessions left by commercial businesses (Vlassenroot & Raeymaekers, 2004). Customary chiefs (Mwami) then had little control over or regulation over artisanal mining, and in exchange for the tax they collected through, formed committees for artisanal mining and "Baganda" servants, who serve the local kings (OGP, 2008:28).

In Twangiza most recently, in 2008, there were many artisanal gold diggers in addition to 600 informal or artisanal gold mines held by roughly 500 persons (OGP, 2008). This indicates that artisanal mining is still taking place in the region that a private company has fully conceded to. However, all artisanal mining operations in the eastern DRC were stopped in 2010 as a result of a state's determination to do so and in Luhwindja due to a significant number of artisanal miners who were against that decision, artisanal mining stopped in Twangiza in 2015 and some artisanal miners shifted to a new mine in Kaduma which is also going to be closed soon since it is part of the 2600 square kilometers (sq. km) that belongs to BANRO.

2.2 Demographic and socio-economic aspects in Luhwindja

Luhwindja appears to be an accurate representation of the demographic and socioeconomic trends in the DRC because it is both a rural and mining location. However, these qualities still do not properly record in Luhwindja. An OGP (2008) survey on mining and development issues in Luhwindja provides some insight into the socioeconomic and demographic makeup of Luhwindja.

In Twangiza, where Banro came to operate, 10000 people used to live there, most of whom were young and living in 2300 houses (OGP, 2008:8). According to the OGP census, the population of the Luhwindja collectivity is rapidly expanding. It increased by 34% over the previous two decades (from 34380 individuals in 1996 to 52148 in 2008). The Twangiza region's groupings (sub-entities), like Luchiga, have experienced the biggest population growth and expansion, largely as a result of the mining operations that draw people to those places (OGP, 2008).

Across the collective, more than 80% of the population, barely 1%, is dependent on wage labor, from private formal mining and certain professional activities, and depends on selling or buying agro-pastoral

products (OGP, 2008). According to OGP (2008), there are four primary sources of income in the collectivity of Luhwindja, which include Twangiza: agriculture, mining, small businesses based on the sale and acquisition of agro-pastoral and manufactured goods, and wage labor.

Over 5000 people in Luhwindja depend on artisanal gold mining; however not all of them live in Twangiza, and some of them come from nearby Villages in Luhwindja (OGP 2008:17). This demonstrates that any policy choices or development initiatives that have an impact on artisanal mining could have a significant negative impact on Twangiza's livelihoods and in Luhwindja in general.

The majority of those engaged in informal mining are adult males, with Children making up 8% of the workforce while women make only 2%. 70% of those working in these activities are native, and the remaining 30% are migrants from surrounding collectivities like Ngweshe and Kaziba (OGP, 2008:17). The projected average monthly household spending in Luhwindja is \$150 USD (OGP, 2008). Even though there is ample food during the agricultural harvesting season, most people can barely afford three meals every day.

2.3 Key Concepts:

2.3.1 Gold Mining

Industrial Mining Companies

Foreign enterprises took a long time to start their operations in the eastern regions of Congo, because of conflict in this area. However, these businesses began prospecting operations in the former gold concessions of Mongbwalu, in Orientale province, and Twangiza, Kamituga, Lugushwa, Namoya, and Misisi, in South Kivu, lured by the dramatic spike in gold prices as well as the relative peace that ruled in the in 2011 (Geenen and Mukotanyi, 2013). Large-scale investors have increasing interest in eastern Congo's mineral potential in the face of increased competition for natural resources. Banro as a multinational mining company started operating in Luhwindja at their Twangiza Mine after receiving a permit from the government. The arrival of Banro made local farmers and artisanal gold miners displaced from a land that they were occupying for decades (Geenen and Claessens, 2013).

Artisanal Mining

Artisanal mining is formally defined by Congolese Law as " people carrying out extraction and concentration of mineral substances, using artisanal tools, methods and processes" (Sovacool, 2019 p.12) Artisanal Mining has supported livelihoods for decades next to agriculture, but with the arrival of multinational mining companies, with explicit support from the national government, this has resulted in dispossession and displacement, as well as altered local power relations, leaving former artisanal miners with few options for a living (Geenen, 2014a). Since the 2000s, multinational mining companies like Banro started to return after many years of war and conflicts in the region and started occupying the land that the local community of Luhwindja was using for Mining to support their families, this led to a displacement of artisanal miners at the local level, yet this mining practice had grown to become the most important livelihood activity after agriculture in South Kivu (Radley, 2019)

2.3.2 Land Tenure

Modern land Law ownership

The modern land law ownership was introduced in 1973 by the government of DRC by that time called Zaire under the Mobutu government, this law state that all land belongs to the state, and although Congolese are allowed to live on the land no one is allowed to own land (Van Acker, 2005) This Law did not take into consideration the customary Law that people were used at.

Customary land Law ownership

Customary land law ownership gives ownership to "the Mwami " who is the customary chief, he distributes the land to his people and gives them the right to work on it either for agricultural purposes or for mining purposes. This land stays in the families for generations and are being passed on as a mean of heritage.

Before, the customary land law regulated a local artisanal mining system and has supported local communities for decades. Hereafter, this was disturbed by the gold mining efforts of multinational mining corporations, using modern Law to evict people from the land. In other words, there is a collision between those that look at the customary Law and those that apply modern Law (Hilson, 2002b) It is seen that multinational companies go to the Congolese government to get a permit of operating which will cause a displacement of informal artisanal mining and agricultural plantation.

2.3.3 Sustainable Livelihood

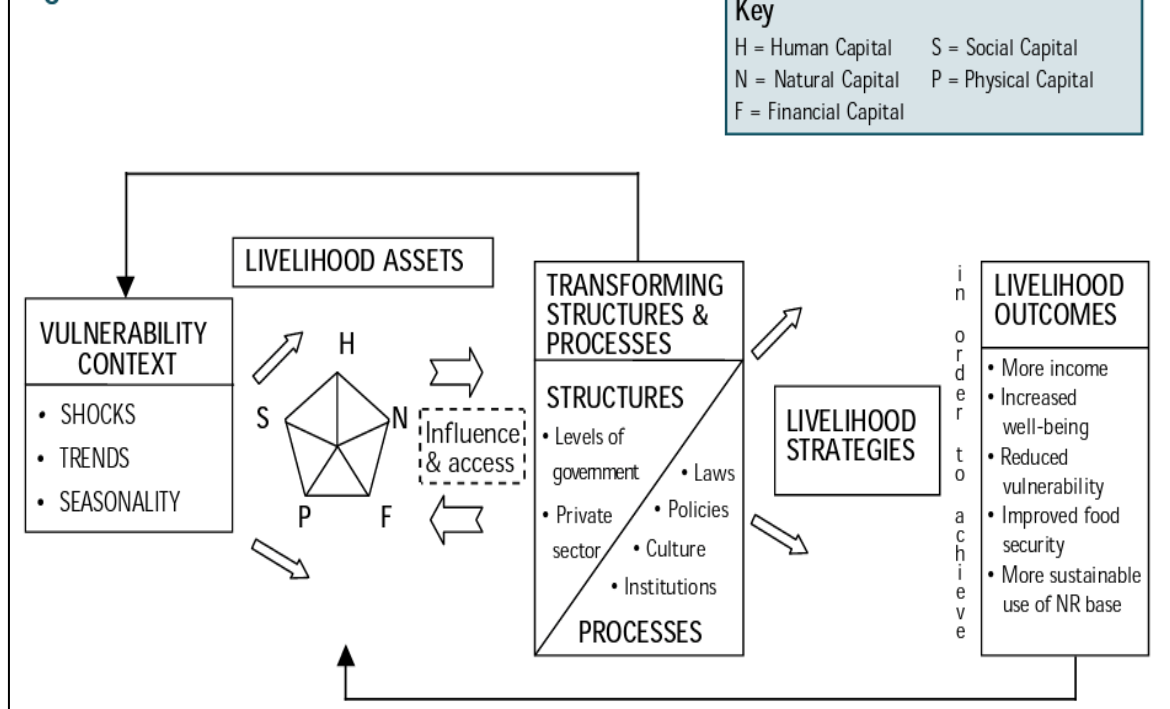
A definition of Sustainable Livelihood is provided by DFID (1999 p.1), DFID first defines livelihoods as *'capabilities, assets (including both material and social resources) and activities required for a means of living*. And then define sustainability by linking it to livelihoods. *'A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base'*.

2.4 Conceptual Framework of the Study

The SLF has been used to better understand how development policies and processes affect "poor people's survival strategies" (Lahiri-Dutt, 2006:13). It's also used to assess livelihoods and "improve people's ability to create a living." to improve their quality of life," while also ensuring that they have options to cope, called coping mechanisms. Adaptive mechanisms are being developed for current and future generations to improve their living conditions (Temeng and Abew, 2009:219), to suit the missions and objectives of different organizations, several SLF models have been developed over time. (Diga, 2007).

The Sustainable Livelihood Framework was chosen as our framework in this study because it allows the researcher to examine the livelihood effects of the suspension of artisanal mining activities and farming on the land used by Banro in Luhwindja and their displacement from the land that they were using for years. Furthermore, the use of DfID's SLF in this study aids in understanding how livelihoods are affected by transforming structures and processes.

Figure 1. Sustainable livelihoods framework



Source: DFID 1999

2.4.1 Vulnerability Context

The external environment in which people live is referred to as the vulnerability context in Figure 1. Trends (such as national or worldwide economic trends, changes in available technology, and political systems), shocks (such as illness or death, violence, and weather), and seasonality are all examples of this (of prices, production cycles, and so on). (DFID 2000). Because the three elements have a direct impact on impoverished people's ability to make a living now and in the future, the vulnerability context is critical to our study.

Vulnerability Context in Luhwindja

A household's or community's vulnerability context is influenced by a variety of external shocks influencing their livelihoods, such as political, environmental, and economic difficulties, causing poor households to become poorer and those who are not poor to become poorer (World Bank, 2001; Osmani, 2003).

In Luhwindja 6000 to 12000 artisanal miners were displaced from their homes with no other means of survival, they had no access to land which was considered as the primary source of living since the majority of people in Luhwindja are farmers and artisanal miners.

The capacity of people of Luhwindja to manage their exposure to numerous hazards, such as displacement, decrease in soil fertility and crop failure, determines the degree of their vulnerability.

In our study in Luhwindja, the SLF was used to assist the researcher in taking account of critical trends over which people have limited or no control, that influence household decisions.

2.4.2 Livelihoods Assets

Resources or capitals that may be acquired, developed, enhanced, and passed down to future generations to assist generate flows, consumption and new assets are referred to as livelihood assets (Diga, 2007).

The SLF recognizes that impoverished households, particularly in rural areas, rely on a diversified livelihood strategy based on a portfolio (various types) of assets rather than income or money alone (see Figure 1 and Figure 2). (Datta and Iqbal, 2003 and Duncombe, 2007). As a result, development processes that impede families' or individuals' ability to acquire and accumulate assets, such as the cessation of artisanal mining and farming activities on the land occupied by Banro, may worsen their living conditions.

In Luhwindja, land is seen as the primary asset that support household's livelihood since the majority of the people are farmers and artisanal miners (Geenen,2013).

The following figure briefly describes the nature and forms of livelihood assets in Luhwindja.

Human Capital

Human Capital is referred to human capabilities such as labour, skills and education level. It is considered to be a fundamental tool for a sustainable livelihood outcome. (DFID,1999)

Human assets are a factor of production at the household level that represents the amount available and capable to work (DFID, 1999).

Some scholars go ahead and state that one of a household's most important resources is the amount of labor that is available, and the quality of that labor may depend on one's health and education (Cook, 2017). In order to achieve general improvements in livelihood strategies and outcomes.

Social Capital

Concerning social assets and their position within the livelihood portfolio, there has been some misunderstanding. Social assets include all forms of social interaction (DFID, 1999). Social assets are further defined as social resources that people use to achieve their livelihood goals. The concept of social capital is still debatable in the realm of development. It has been defined by some academics, such as Nasrnia & Ashktorab (2021), as a resource that enables or assists people in achieving their livelihood goals.

According to DFID (1999), in the SLF framework, social resources can be developed through joining more organized groups, forming specific networks within communities, building trusting connections with people, and other methods.

Natural Capital

In rural areas, where the majority of people work in agriculture, natural resources constitute an essential component of the assets. The possibility of farming depends on the natural resources available, which also influences the amount of production (Cook, 2017).

Natural capital refers to the stocks of natural resources, such as land, woods, water, air, and soil, that people may use to support their livelihood (DFID,1999). Natural resource like minerals, land, rivers and Lake Jubi are the most common natural capital used in Luhwindja.

Financial Capital

Financial assets are any of the various financial resources, such as cash flows, savings, and credit-granting institutions, that people employ to attain their livelihood goals (Scoones, 2009). A definition offered by DFID (1999) states that financial assets are financial tools that people employ to pursue their aspirations for a sustainable livelihood outcome. They consist of both flows and stocks, which can simultaneously contribute to production and consumption. Financial assets include assets such as income generation, loans, savings etc..

Physical Capital

Social infrastructures such as housing, roads, water, and electricity installations as long as durable goods such as vehicles, are examples of physical assets (Ellis, 2012). People can meet their fundamental requirements and become more productive with the aid of social infrastructure, such as roads, water supply and sanitation, energy, schools, hospitals, and information access. Having a safe place to live and the instruments necessary to support a livelihood are also essential; for farmers, these may include also cattle and farming equipment (DFID, 1999). Numerous studies demonstrate that poor infrastructure can be a significant factor in poverty. In addition, the time required to ensure adequate energy and water supplies might hinder income-generating activities (Payne, 2004). For farmers, access to markets and the ability to transport goods like crops and fertilizer depend on the availability of transportation infrastructure.

2.4.3 Transforming structures and processes:

External variables to households, such as public and commercial institutions, and cultural and policy actions, that can favorably or negatively affect households in a vulnerable environment are referred to as transforming structures and processes (Adgei, 2007). Using SLF enables the researcher to understand the external factors that are affecting people's access to land.

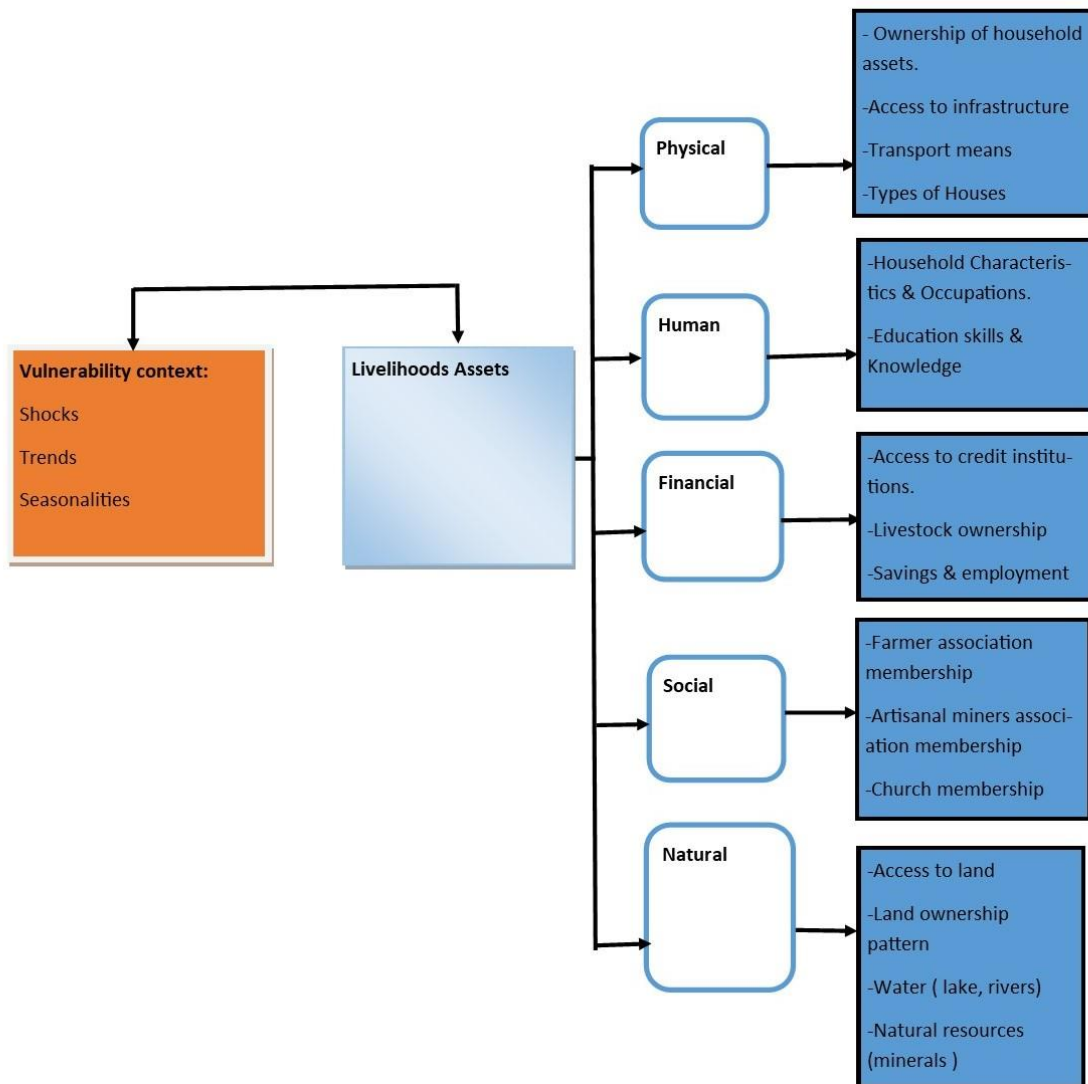
2.4.4 Livelihoods Strategies

Furthermore, household activities or coping methods to the impacts of changing structures and development processes are referred to as livelihood strategies and outcomes (Diga, 2007). This approach will provide the researcher with a framework for analyzing livelihood activities in Twangiza and how they have been influenced by the suspension of artisanal mining and farming activities on the land that Banro is occupying as a development process.

2.4.5 Conceptual Design and Operationalization

The figure below indicate the main concepts, dimension and indicators of the people in Luhwindja. The vulnerability context which was derived from the SLF describe different shocks, trends and seasonality that people are exposed to and its effect on livelihood assets.

Figure 2 : Conceptual Design and Operationalization



Source: Mushayuma,2022

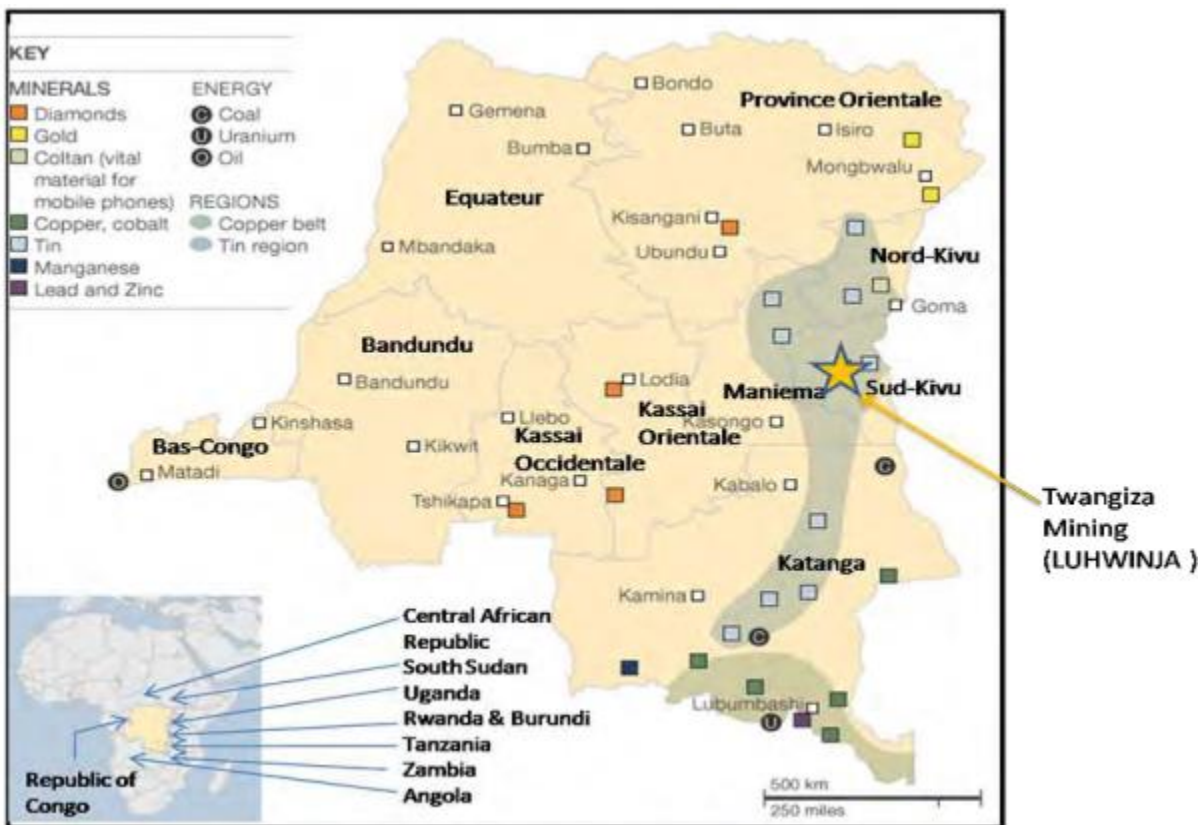
CHAPTER 3: RESEARCH METHODOLOGY

3.1 Study Area

The research site will be in Luhwindja in the territory of Mwenga in South Kivu Province. Banro's Twangiza Mine is in Luhwindja. The company's mining project is located in regions that were once owned by the local population, who subsisted on artisanal mining and agriculture. Six communities in Luhwindja (Bigaya, Luciga, Buhamba, Lwaramba, Nyora, and Cibanda) were displaced. Banro's Twangiza mine headquarters is in a 183 km² area that was previously home to around 93,147 people. (Mayanja, 2019)

As a leader of Research, I will be based in Bukavu which is situated around 41 km from Mwenga, and my assistant researcher will be staying in Luhwindja. However, I will stay in Luhwindja for 3 weeks.

Figure 3: Map of DRC with mining Areas Showing Luhwindja in South Kivu Province



Source: (<http://www.google.co.za/imgres?q=DRC+map+minerals>)

3.2 Research Design

The research design includes the researcher's overall strategy for solving the research question (Saunders et al., 2009). This Research will be conducted in the form of a qualitative research study to comprehend the social situation from our participants' view. According to Gillham, a case study investigates a specific individual, institution, or society in specific situations to answer specific research issues (Gillham, 2000). As a result, to investigate the current study, this methodology was adopted to investigate the effect of industrial mining on household's livelihood in Luhwindja.

3.3 Methods of Data Collection

The triangulation method was used in collecting and analyzing data to ensure the validity and reliability of the results, as explained in the book "Research for Development" by Laws et al. (2013). This means the researcher used different methods in collecting and analyzing data to answer the main question and the 5 sub-questions while ensuring the validity and reliability of the results. It is thought to be important to collect data in different ways because the means through which data are collected has an effect on the findings. The researcher collected data using different ways in order to build confidence in the trustworthiness of the data collected, as mentioned in the book "Research for Development" by Laws et al. Initially the researcher planned to conduct 7 different focus group discussions of 8 people, each among them 2 groups of farmers, 3 groups of artisanal miners, 1 group of women and 1 group of youths. This was not possible anymore but only 5 focus group discussion were conducted of 7 people each, it was not also possible to separate the people according to their gender or their profession since the sampling method used to select the respondents were a non-probability sampling method where the researcher rely on participants help to identify the next participant of the study, this made it difficult to start separating people into group instead of forming a group discussion with the participants that are present and proceed with data collection.

An interview to the 5 key informants each one separately, were the first method used since it helped the researcher to have an overview of the situation in Luhwindja, then the focus group discussions with 35 respondents followed with participants that were identified using a snowball sampling method as mentioned bellow and finally 10 in-depth interviews were conducted after identifying possible interesting cases during the focus group discussions. The observation was used during both interviews and focus group discussions.

The followings are the methods that was used during our data collection:

3.3.1. Focus group discussions (FGD)

Focus group discussions were conducted to understand how farmers and artisanal miners were impacted by industrial mining. These Focus Group Discussions were done in 5 different groups of 7 people per group to collect data from a different source and verify its reliability.

This was conducted using a triangulation method since the researcher used different data sources to develop a comprehensive understanding of the livelihood activities in Luhwindja and how this was affected by industrial mining. To make this possible, the FGD had farmers, artisanal miners, and small business traders to allow the researcher to collect information from different sources.

Table 1 : Profile of respondents in the Focus Group Discussion

Focus Group Discussion (FGD)	Gender		Total
	Male	Female	
FGD 1	3	4	7
FGD 2	4	3	7
FGD3	3	4	7
FGD4	3	4	7
FGD5	4	3	7

Total	17	18	35
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Source: Mushayuma, 2022

3.3.2 Interviews

3.3.2.1 Key informants Interviews

Interviews were conducted with the five key informants (a catholic priest, a local chief, 2 Banro employees and one local government officer) as mentioned above, separately from a household interview; this helped the researcher to have the general situation of Luhwindja and understand how the local community was affected by industrial mining and their livelihood activities before the arrival of Banro in 2011. With this method of data collection, the researcher in collaboration with the Key informants were able to answer the first and last sub-questions of our study.

Table 2: *Profile of Key Informants*

Key Informants (KI)	Profession	Gender		Total
		Male	Female	
Key Informant 1	Catholic Priest	1	0	1
Key Informant 2	Local Chief	1	0	1
Key Informant 3	Local government authority	1	0	1
Key informant 4	Banro employee (Assistant Procurement officer)	1	0	1
Key Informant 5	Banro employee (Assistant Human Resource Manager)	1	0	1
Total		5	0	5

Source: Mushayuma,2022

3.3.2.2 Household Interviews (In-depth interviews)

First, the researcher conducted 5 different FGD and then followed it up with 10 in-depth interviews after noticing possible interesting cases. These interviews were conducted in the house of the participants to understand how much their households were affected by industrial mining. The profile of the participants with they assets and activities are well detailed in Appendix 2.

3.3.3 Observations

An observation was made during the 5 focus group discussions and the interview sessions both during the individual interview and the household interviews from what the respondents are saying to what is being seen like the kind of food that they are eating or preparing during the interview session at their homes if the children look healthy and not showing any form of malnutrition or the kind of house that they are living in.

3.4 Steps used to collect primary data

The first step used in collecting data was to identify the 5 key informants , after this was done the researcher started conducting interview with each key informant separately from another , 5 interviews were done to 5 key informants. This was followed by identifying focus group discussion respondents, since the researcher used a snowball sampling method, the current respondent were ask to identify the next possible respondent who would be relevant for the research study. 5 different focus group discussions were conducted, this allowed the researcher to identify 10 respondents for an in-depth interview at their homes.

3.5 Data Sources

3.5.1 Primary data sources

3.5.1.1 Participants observations

Participants observation was used to complement Key informant interviews, Focus group discussions and household interviews; this was done to keep an eye on the respondent's behavior and their surrounding from what they say to what the researcher is actually seeing.

3.5.1.2 Audio recording

Audio recording was used for both interviews and focus group discussion since the majority of respondents were talking very fast and didn't want the researcher to write what they are not able to read, so they only agreed on an audio recording and not coping with a pen and a paper what they are actually saying. Audio recording was seen as a very useful data source through out the data collection process.

3.5.1.3 Reflective Journal

A reflective journal was used by the researcher each day after ending a data collection session, the research would play the recorded audio and write pertinent information in the journal, this was very helpful for the researcher to see how far he has gone in times of information collected and what is still needed.

3.4.2 Secondary data sources

The following secondary data were used both during and after desk study : journals, published thesis from google scholar, website and online libraries, articles, and books. Non-academic reports from different organizations and governments.

3.6 Sampling Techniques

The key informants of the study were chosen and reached out to using a purposive sampling technique. According to Oliver and Jupp (2006), purposive sampling allows the researcher to determine "regarding the particular participants who would be most likely to offer acceptable data, both in terms of relevance and depth" based on specified criteria related to the study's objective. Recognizing that this form of sampling can be a "possible source of bias"

(Oliver and Jupp, 2006 p.12) the researcher made certain that the selection criteria of the 5 key informants were in line with the study's objective to maintain the study's validity.

Other participants were chosen and reached out using a snowball sampling. A Snowball sampling method is a non-probability sampling method where currently enrolled research participants help recruit future subjects of the study, meaning a respondent will aid in the identification of the next respondent (Oliver and Jupp, 2006).

The difficulty with snowball sampling is that it can lead to bias because some participants who may not be able to offer necessary information for the Research may be identified by the respondent (Oliver and Jupp, 2006).

Nonetheless, the snowball sampling approach was used in this study because the researcher is a stranger in the area, although originally from Luhwindja, he doesn't know the various location of the people within the community.

3.7. Operationalization of Research Methods

Table 3 : Operationalization of Research Methods

Sub-question	Source of information	Data collected method	Sampling	Where
1.What were the livelihoods activities in Luhwindja, South Kivu Province, DRC before the arrival of Banro in 2011?	Key informant 1 (Catholic Priest)	Interview	Purposive sampling method	Office at church
	Key informant 2 (Local Chief)	Interview	Purposive Sampling Method	His home
	Key informant 3 (Local Government officer).	Interview	Purposive Sampling method	Office
	5 different group of 7 people each	Focus group discussions	Snowball Sampling Method	Community Centre
		Observations	Purposive Sampling Method	Field Work
2.What was the effect of artisanal gold mining on household's livelihoods in Luhwindja, South Kivu Province, DRC?	Group Discussion 4	Focus Group Discussions	Snowball Sampling Method	In a Shirika (small church where people meet for different informstions)
	Group Discussion 2	Focus Group Discussions	Snowball Sampling Method	In a Shirika

	Key informant 2 (Local Chief of the area)	Interview	Purposive Sampling Method	At his home
		Observations	Purposive	Field Work
3.What is the effect of industrial gold mining on household livelihood assets in Luhwindja, South Kivu Province in DRC?	Respondent 8	Household Interview	Purposive	At his home
	Respondent 9	Household Interview	Purposive	At his home
	Group discussion 1	Focus Group Discussion	Snowball Sampling Method	In a Shirika
	Group discussion 4	Focus Group Discussion	Snowball Sampling Method	In a Shirika
		Observations	Purposive	Field Work
4.What vulnerabilities do households have in Luhwindja, South Kivu Province, DRC due to industrial gold mining?	Key Informant 1	Interview	Purposive sampling	His office at church
	Respondent 6	Household Interview	Purposive Sampling	Her home
	Respondent 7	Household Interview	Purposive Sampling	His home
	Respondent 8	Household Interview	Purposive Sampling	His home
	Respondent 9	Household Interview	Purposive Sampling	In her home
	Respondent 10	Household Interview	Purposive Sampling	In his home

	Group Discussion 4	Group discussion	Snowball Sampling method	Inside a Shirika
	Group Discussion 5	Group discussion	Snowball Sampling Method	Outside the Shirika in a small farm
		Observations	Purposive	Field Work
5.What are strategies in other localities that harmonize interests which could be embraced by both the local communities and the industrial gold mining company in	Key informant 2(local Chief)	Interview	Purposive	His home
	Focus Group Discussion 1	Focuss Group Discussion	Snowball Sampling Method	Inside a Shirika
	Focus Group Discussion 2	Focus Group Disucssion	Snowball Sampling Method	Community centre
	Focus Group Discussion 3	Focus Group Discussion	Snowball Sampling Method	Community Centre
		Observations	Purposive	Field Work

3.6 Data Analysis

In order to create a clear description of a topic in the final stages of analysis, qualitative data must be organized in a way that helps the researcher formulate themes, refine concepts, and link them together. Qualitative data is a collection of fragments from interviews, reports of participant observations, and focus group discussions (Baarda & Law et al, 2014). Data analysis started as I was conducting data collection; this allowed me to see if I needed more additional information and was able to analyze the data that I was getting from my respondents using an observation.

As a researcher, I organized data in Microsoft Excel according to the method of collection, meaning data from interviews separated from data from observation and focus group discussion, then a triangulation method was used separating respondents from each other and compare their answers in order to eliminate what seemed to be not relevant to answer our research question, and considered the most common answer among respondents. As mentioned by Van Thiel, (2014) qualitative data are datasets

that are often non-numerical and unstructured. The researcher used excel spreadsheet and to analyze data using a triangulation method and finally come with a conclusion according to the question asked. The results were then presented utilizing a narrative and visuals (images and transcripts of the recorded interviews). The narratives were enhanced with statements from respondents to serve as evidence.

3.7 Ethical Considerations

In carrying out fieldwork during data collection the researcher considered ethical concerns that could arise among respondents. The researcher presented the objective of the Research to the participants and inform them that they will not be any form of reward for information given, also the participant or interviewees had the right to stay anonymous. The researcher respected all the cultural norms while collecting data, before starting any sort of activity within the community, the researcher sought approval from the local chief of the area first and then proceed with the data collection process.

3.8 Limitations and challenges

The first limitation was the Geographic location of Luhwindja. This was particularly a problem when it started raining, Luhwindja is located in a mountainous area, and moving from one distance to another when it rained was hard because there is no public transport available.

The researcher being originally from Luhwindja, made Banro employees bias thinking that the researcher will be on the side of his tribemate and blame Banro for occupying the land or worse scenario disclosing their identity.

CHAPTER 4: RESULTS

4.0 Introduction

This chapter presents the findings of the Research on the effects of industrial mining on livelihood in Luhwindja. The results of this study starts with giving the socio-demographic characteristics of the respondents , their living conditions , education level and then start answering the 5 research sub-questions. The results from interviews, focus group discussions and observations are presented in the form of tables, and pictures that were taken in the field.

4.1. Socio-Demographic & characteristics of respondents

A total of 40 respondents participated in our Research, 5 of them were our key informants, 35 participated in group discussions of which 10 in-depth interviews were conducted to collect data on the effects of industrial mining on household livelihood in Luhwindja. The socio-demographic characteristics of our respondents comprise their gender, age, education level, and their household size since our data was collected from different people (data source)

4.1.1 Sex composition and age of respondents

Twenty two men were represented in our 40 respondents sample size and 18 female. The age group between 18 and 40 had the most involvement both in farming and artisanal mining (70%), followed by the 40 to 50 age group (20%) Ten percent of people were 51 years and older.

4.1.2 Education Level:

Out of 40 respondents, 10 only completed high school and among them our 5 key informants and 5 others respondents that participated in the household interviews. One reason there are so many illustrate in Luhwindja is because they are minimal schools in the area.

Table 4: *Number of Schools in Luhwindja*

Number	Total
Kindergarten	0
Number of primary school	25
Number of secondary school	13
Number of Secondary school without infrastructure	2
Number of professional school	0

Source: Key Informant 2

4.1.3 Household Size

Household size were very important for this study since it has a high impact on household livelihood asset. Out of the 40 respondents, 22 respondents had 5 to 8 people living in their household, 10 had 1 to 4 people and 8 respondents had 9 people and above.

4.1.3 Living conditions in Luhwindja

To comprehend the context in which BANRO's Twangiza gold mining effect on household livelihood in Luhwindja, as well as the elements that might have made individual households and the entire community more vulnerable, a description of living conditions, including livelihood activities and socioeconomic challenges, was described. The demographic and socioeconomic data of their homes were requested from household heads. Figure 7 below presents a summary of the respondent's household who were interviewed, outlining the characteristics of their households' living situations, including size, employment status, income, sources of revenue, assets, sources of assets, and levels of education.

4.1.4 Household Livelihood Assets:

In terms of asset accumulation, the majority of households in Luhwindja seek to invest their income in some kind of asset, such as a house made of solid materials, a piece of land for farming, raising livestock (cows, goats, rabbits, or a business, etc. But because the ability to acquire assets depends on income levels, informal mining households with higher earnings should be able to do so more efficiently than non-informal miner households with lower incomes.



Source: Mushayuma,2022.

4.2 Livelihood activities in Luhwindja before the arrival of Banro.

After conducting 10 household interviews as in Appendix 2, most households in Twangiza rely on diverse livelihood strategies that combine multiple activities. However, for the majority of households, farming and artisanal mining turn out to be the main sources of income. As mentioned in Chapter 3, the sample of this study was done using a purposive sampling method and a snowball sampling method to answer our research questions; however, this does not reflect all of the homes in Luhwindja. A conclusion that the majority of people rely on informal mining in Luhwindja, can only be drawn from surveys like OGP (2008) did and took over 200 homes for sample size, which indicated that in Luhwindja, where BANRO's Twangiza gold mining is situated, professional activities and wage labor accounted for 1% of employment and that agriculture and informal mining were the primary sources of income. Because it is qualitative, this study only employs Table 4 to explain livelihood situations at the household level and their livelihood assets.

"Most people in Luhwindja do not want to be involved in other activities since artisanal miners had more income than any other people, artisanal mining were looked at as the primary activity of people in Luhwindja, along with agriculture before the arrival of Banro" (Group discussion 1)

All of the respondents named farming and artisanal mining as the most significant livelihood activities in the region. Artisanal mining is frequently seen as a male-oriented activity since it requires a lot of physical strength, especially one geared toward young men. However, informal miners often give up some of their time to assist their wives with farming tasks.

"People in Twangiza cannot survive without artisanal mining and farming; our land serves as both our store and our main source of income. Men engage in artisanal mining, but the majority also have fields that their wives and daughters work in during the day. Some women also assist in mining by cooking for artisanal miners" (Key Informant 1).

"Farming or agriculture was another significant and large source of subsistence in Twangiza. In general, it refers to products like cassava, potatoes, bananas, maize, beans, and rice that were formerly "exported to neighboring rural communities" in addition to serving as the region's primary source of staple food (Focus Group Discussion 2).

"Livestock such as cattle, pigs, goats, and rabbits are also part of farming, because of their ability to produce both milk and meat, cows are regarded as the most significant livestock "(Focus Group Discussion 3).

The primary sources of income accessible at the community level in Luhwindja are informal Mining and farming, small businesses and labor-paying or professional activities are other sources of income, though they are less significant than informal Mining and agriculture, according to Key informant 2, who also claimed that:

"Only a few people are engaged in other activities, small businesses typically only open once or twice a week, except for those found in major cities that are open every day , others sell agricultural and manufactured goods at mining sites, small shops, and restaurants along the sides of the road, and small local markets. Contrarily". (Key informant 3),

It is not unique in Luhwindja to use the multi-activity livelihood diversification technique. It is a typical occurrence in underdeveloped areas. In many African rural communities, where the poor typically depend on livelihood activities based on a portfolio of assets, informal mining is frequently driven by poverty, according to Hentschel et al. (2003) (Datta and Iqbal, 2003 and; Duncombe, 2007). This is also in line with the asset-based strategy of the SLF, which acknowledges that individuals cannot improve their living conditions through income alone, especially in rural areas where it is typically lower than in urban areas.

4.3 . The effect of artisanal gold mining on household's livelihoods

According to our key informants, artisanal miners sell their gold to small cooperatives in Luhwindja; some even go to the nearby city(Bukavu); and sell their gold to cooperatives with a license to take gold abroad and sell it at a higher price.

It was hard to find out the actual monthly income of a household while acknowledging that incomes are frequently underreported in research, Table 3 in the Annex demonstrates that the majority of households depends on a diversified livelihood strategy, with those involved in informal mining earning the highest income relative to those interested in other activities, including formal mining and small business. In some cases, artisanal mining was the only household income source.

"Artisanal mining has been supporting household livelihoods of people of Luhwindja for years, we were able to pay school fees for our children due to an income from artisanal mining and teachers were able to be played in return as well," (Group Discussion 4).

Due to artisanal mining, people were able to build houses, buy more assets, and invest more in their livestock since they were earning enough; in this sense, artisanal mining was playing a huge role in reducing the level of vulnerability of the people by increasing their income and helping them invest more in their livestock .

4.4. The effects of industrial gold mining on household livelihoods assets

4.4. 1 Household assets Liquidation

Most people were forced to sell their land due to the introduction of industrial mining. People were given a small amount of money and were asked to sell their land, some respondents mention that they received 150\$ they had no choice but to take the money or move without taking the money , however some were given a little bit more compare to the size of their land and they were able to start small businesses and buy motorcycles that were use for public transport purposes.

"Our lands were not really bought at their Value , I was given 150\$ for my land some people received more but no one receive the money according to the value of their land, we were asked to move after that and the government provided us the mountain of Cindjira to go a live there, that mountain is very cold and nothing grows there" (Respondent 8)

"One of the respondents was asked about the effects of industrial gold mining on his household livelihoods assets, and the answer was: "Selling our assets seem to be the best decision at that moment in order to survive; some people sold their lands, others their cows and goats just to be able to survive since they were no support from the government" (Respondent 9)

4.4. 2 Decrease of household's human capital due to migration

Most households in Luhwindja were affected by the introduction of industrial gold mining when people found themselves unemployed and were forced to migrate to other villages in pursuit of a better life, some men left their wives and kids behind to migrate to the city of Bukavu or the nearby villages looking for work.

"my husband and my son left to Bukavu to look for a job since there is nothing else felt here, both of them were working in artisanal minings and were unemployed when BANRO came to Luhwindja" (Respondent 8).

4.4.3 Physical Capital

Accessibility to water was never a problem in Luhwindja due to a lake Jubi close to Twangiza Mine, now with the current pollution with the waste of the mining industry that is being dumped in the Lake, people no longer use that water from the lake and have to walk miles to access water.

"Banro has been dumping their waste in Lake Jubi, we have been using water from the Lake for years for household purposes and we use to give it to our cattle , it was easily accessible, now that the water is polluted , we cannot use it anymore and are forced to walk miles to a nearby river"

(Group discussion 4)



Source: Field Work , Photo taken of Lake Jubi

4.4.4 Financial Capital

The primary source of income for most households in Luhwindja was artisanal mining and farming both of which were affected by industrial mining and left so many people unemployed and without any other activity to take care of their family needs. This happened when people were displaced from their homes and stopped to operate in mining and farming since their land was taken by BANRO.

“ This land is like a mother and a father to us; we cultivate different crops on it and use our land for mining purposes as well; without this land, we cannot survive, we don’t have anything else to do besides farming and digging gold” (Group Discussion 1)



Source: Mushayuma, 2022

4.5 Vulnerability context of households in Luhwindja

People of Luhwindja are exposed to different vulnerabilities that involve shocks and stresses like being displaced from their homes, a high rate of unemployment, disease outbreaks, and a very cold weather on the mountain Cindjira where people were asked to stay after being displaced from their homes.

" The suspension of artisanal mining and the displacement of the people to a very cold mountain made life so hard with no other means of survivor. " (Focus group discussion 3)

4.5.1 Social and economic difficulties

The majority of respondents believed that the main socioeconomic issues in Luhwindja were poverty, a decline in agricultural production, a lack of social infrastructure and basic services, and low levels of education. Other issues included social and political unrest, forced relocations, contamination of the environment, prostitution, and child labor.

Unfair land transfers were noted as another socioeconomic issue that people faced in Luhwindja. The majority of respondents, including both community leaders and heads of households, noted that as part of BANRO's official mining development in the area, people were forced to sell their land and move. Despite the fact that some landowners received compensation, the procedure was frequently forced and unfair. The life story following is an example of the unfair land relocation process in Luhwindja and was shared by our respondents in our 4th group discussion.

"Baguma Murula is a married father of five children and the owner of a plot of land measuring roughly 40/30 meters. He has built two houses there and engages in agriculture, alternating between growing beans, green vegetables, sweet potatoes, cassava, and other crops throughout the course of the year. He also planted trees in this area, some of which were 5 to 6 meters tall at that moment. N.B.: BANRO made him an offer of \$120 USD for this land".

In Luhwindja where the majority of households depend on both farming and informal mining, unfair land relocations have posed a danger to livelihoods. Following is a description of how the land relocations affected people's livelihoods:

"BANRO has ruined our land because BANRO has grabbed the area where people used to grow their crops and feed their livestock. Numerous people had to sell their land holdings because BANRO compelled them to, not because they wanted to. When you refuse to sell your land, they threaten to seize it whether you like it or not because the industrial mining bought the entire area from the government (Focus Group discussion 4).

4.5.2 Poverty and unemployment

Most respondents believed that poverty resulted from a lack of money, food (hunger), and clothing, primarily as a result of unemployment and declining agricultural production. Lack of access to fundamental social infrastructures and services, such as clean water, power, and education, was also linked to poverty.

" the people of Luhwindja are no longer able to pay for school fees for their children , having access to a nutritious food on a daily basis becomes a problem and the situation is getting worse every day (Local government officer),.

"Employment is a serious problem here, artisanal mining and farming were the major livelihood activity in Luhwindja," (Key informant 4)

"....While BANRO only employed 500 individuals yet they promised to employ more people, initially 3,000 to 5,000 people were mining gold from the lake in Twangiza before the arrival of BANRO,...."
(Respondent 7,).

In Luhwindja, artisanal mining was not only a source of revenue and employment, but it also supported the human and financial resources required to advance agricultural activities. As a result, employment in the agricultural sector benefited from this activity.

"Even the men who own property for farming were mining gold while their spouses worked in the fields since they could pay other women who don't own land to work as their laborers". (Focus Group Discussion).

When BANRO came to Luhwindja, they employed some of the artisanal miners and farmers who were living in Twangiza, however BANRO used a third party to employ of Luhwindja to avoid signing any contract with them, other people moved to a less productive mining location (kaduma), which affected their capacity to make money and buy food (Key Informant 2,).

While unemployment was the primary cause of poverty in Luhwindja in terms of lack of income, this was also linked to the decline of agricultural production.

"Some people used to cultivate for others and get paid from [informal] mining income, but since mining was shut down, agriculture also collapsed"(Respondent 10).

Small enterprises were also in danger because of the suspension of informal mining, in addition to jobs tied to agriculture and informal mining. There had been a close relationship between small business and artisanal Mining in Luhwindja. (Respondent 8) claimed that artisanal mining was regarded as "the lungs of the whole economy" and that small merchant were no longer in business since their primary customers were those who entered mining sites. Thus, the suspension of artisanal Mining in Luhwindja had a bad effect on neighbourhood traders. (Respondent 6) described his own experience as follows:

"Since artisanal mining was put on hold, we've experienced a significant drop in business. We have been without sales for weeks. Because informal miners' families reside here, they used to buy in large quantities from our business whenever they wanted to, which allowed us to sell to them every day. Other people arrived from nearby villages, and they purchased from us to return to their relativesThey only purchase from us at the end of the month now that they are BANRO employees. The issue with BANRO is that many of its employees are not from this neighborhood. Their family doesn't reside here, and many of them are immigrants from other nations like Tanzania and South Africa. They don't purchase anything from us; they bring their own meals and belongings. If you just sell a few items, you'll have to spend all the money you make on food before you have enough money to buy more products from the wholesaler. As a result, the store's inventory of goods gradually ran out."

According to the mentioned respondents, a combination of effects on unregulated mining, unregulated agriculture, and unemployed small company owners led to increased revenue loss, food insecurity, poverty, and school abandonment.

4.5.3. Outbreak of diseases and environmental pollution

There is a lake in Luhwindja called Lake Jubi, this lake is close to BANROS's Twangiza mine and has been used by the people for so many years to fetch water both for their cattle and for the household, when BANRO came to Luhwindja, they started dumping their wastes from the industry inside that Lake, this went on for a long time until when people started falling sick from using water from the Lake. The petition in the annex was written against BANRO on this matter and was signed by over 100 people.

"we used to use water from the lake both for our cattle and for our household purposes but now that all the waste that comes from the mining industry is being dumped in the lake, this has brought so many disease among us and has been the cause of death to some"

4.5.4 Decrease of agricultural production

Because farming is mostly done for subsistence, a threat to it could cause food insecurity in Luhwindja. Different responders identified 4 critical causes of the decrease of agricultural production: plant disease, farming methods, informal mining, and formal mining. For instance, respondent 10 claimed that *"fields are not fruitful anymore because of the mozaïque illness which is destroying our plants"*. A form of illness known locally as "mozaïque" damages crops, mostly cassava, causing their leaves to become yellow, as a result preventing them from successfully expanding. Contrarily, another respondent said that farming practices had prevented the land from replenishing. He said this: *"Agriculture is no more fruitful; I think the land is now exhausted since it has been used for too many years."* (Respondent 9). However, a different reply (from the local government officer) cited informal mining as a threat to Twangiza's farming. He claimed that *"people are becoming poorer due to artisanal mining because people disregard agriculture"* (Key informant 1).

4.5.5 Low levels of education

Illiteracy was mentioned as one of the main issues in Luhwindja. The majority of households have very low levels of education, as shown in Table 2. The explanations given for the low levels of education in Luhwindja by our respondent 3 included "... a lack of funds, a lack of government or parental support for their kids' education, very limited schools and most of them were located in a far distance, also some parents prefer sending their kids to dig gold instead of spending the all day in school. As a result, numerous kids have been compelled to quit school and enter into early marriages or start working in artisanal mining..."

"Because they are in poverty, those kids work in mines. Would parents with money permit their kids to work in mines instead of attending school? ... Even on holidays, children go to mines to survive since the state does not pay public employees", (Key informant 3)

"Education issues and children dropping out of school result from parents being unemployed and unable to pay school fees for their children, also in Luwindja there are no professional schools, and there are very limited number of schools both primary and secondary school, those are some of the reasons why, the rate of illiteracy is very high in Luhwindja" (Key Informant 1)

4.6. Coping strategies of the people of Luhwindja

Different people used various adaptive strategies to deal with the effects of the suspension of artisanal mining. Depending on their levels of vulnerability, people's responses to the effects of the suspension of artisanal mining in Luhwindja varied widely.

Some people had little choice but to remain at home, while others sold their possessions and/or looked for alternative work, including moving to town. Most often mothers and children who are most at risk participate in stealing and prostitution.

4.6.1 Staying at home and asset liquidation

Artisanal mining and farming were the major activities used in Luhwindja, and the land that BANRO is occupying was the most productive land for both artisanal miners and farmers, according to our second group discussion. The effects of the suspension of artisanal mining and farming in this area affected the community's households, and as a result, many individuals were left with no choice but to remain at home. When asked whether informal miners engaged in alternative pursuits, one responder replied:

"there is nothing else to do when people have no land to cultivate or to dig gold; very few people were employed by BANRO through an employment agency and were earning less than they used to earn while practicing artisanal mining activities." (Respondent 7, Artisanal Miner)

Some people made the decision to sell the assets they had collected prior to the suspension of informal mining in order to survive at home. (According to Respondent 12), *"People started selling their wealth, such as cows, goats, land, etc. in order to survive."* As a result, the community's living conditions were deteriorating.

In order to achieve economic and social growth, assets are crucial, according to Gamble and Prabhakar (2005).

4.6.2 Alternative employment and migration

Finding alternative employment was the other coping strategy used to deal with the suspension of artisanal mining. While some people were able to work with BANRO in some capacity, others started their own businesses or left the area. The local government official, who is one of the key informants, responded to the question of whether Twangiza's informal miners had turned to different pursuits by saying:

"I don't believe so, but some of the people digging in Twangiza were getting training for alternative jobs, and some of them were even working for BANRO but only a very small percentage, but the issue is that most people in Twangiza (Luhwindja) did know any other work beside digging gold and farming, some people went to work in another mine in Kaduma not far from Twangiza which is thought to be part of the BANRO concession and will soon be taken away as well" (Respondent 1, Local Government officer).

Additionally, even individuals who kept their jobs at BANRO still make less money than previously. Respondent 5 (Mineral Trader) provided the following explanation: *"With informal mining, people were making a lot of money; a person could make anywhere between \$500 and \$1000 per month. He can buy a cow, goat, or pig with this money and use the rest to buy food. What can he do with \$100 or \$120 if you gave it to him now? However, BANRO does not allow individuals to mine gold in Twangiza."*

As a coping and adaptive strategy to lessen the negative effects of the suspension of informal mining, some people worked for BANRO. However, others, particularly those who had substantial assets to liquidate, reinvest the money in other endeavors for self-employment.

"Because artisanal miners who had saved their money decided to buy motorcycles to be used for public transport in order to find alternative employment, the number of motorcycles has surged in the area." (Respondent 6, farmer)

"I'm telling you, there is nothing else people can do in our community besides mining minerals. There are some people who uses motorcycles for public transport purposes, and others have small shops for business but they are not many ". (Focus Group Discussion 3)

4.6.3 Prostitution and theft

Some people who felt like they had no other choice, theft and prostitution were their only options for coping with the situation in place when informal mining was not allowed in in Twangiza anymore due to the arrival of BANRO

According to Respondent 10, an informal miner, “People started stealing from one another, life grew worse” Participants in the group interview stated, in more precise words,

“Since the males stopped going to the river, things have worsen in this area. [...] Some of those children who stopped attending school started robbing individuals in the neighborhood. Now, if no one is home when you wash your shirt and leave it outdoors, you won’t find it when you get home”. (Focus group discussion 4)

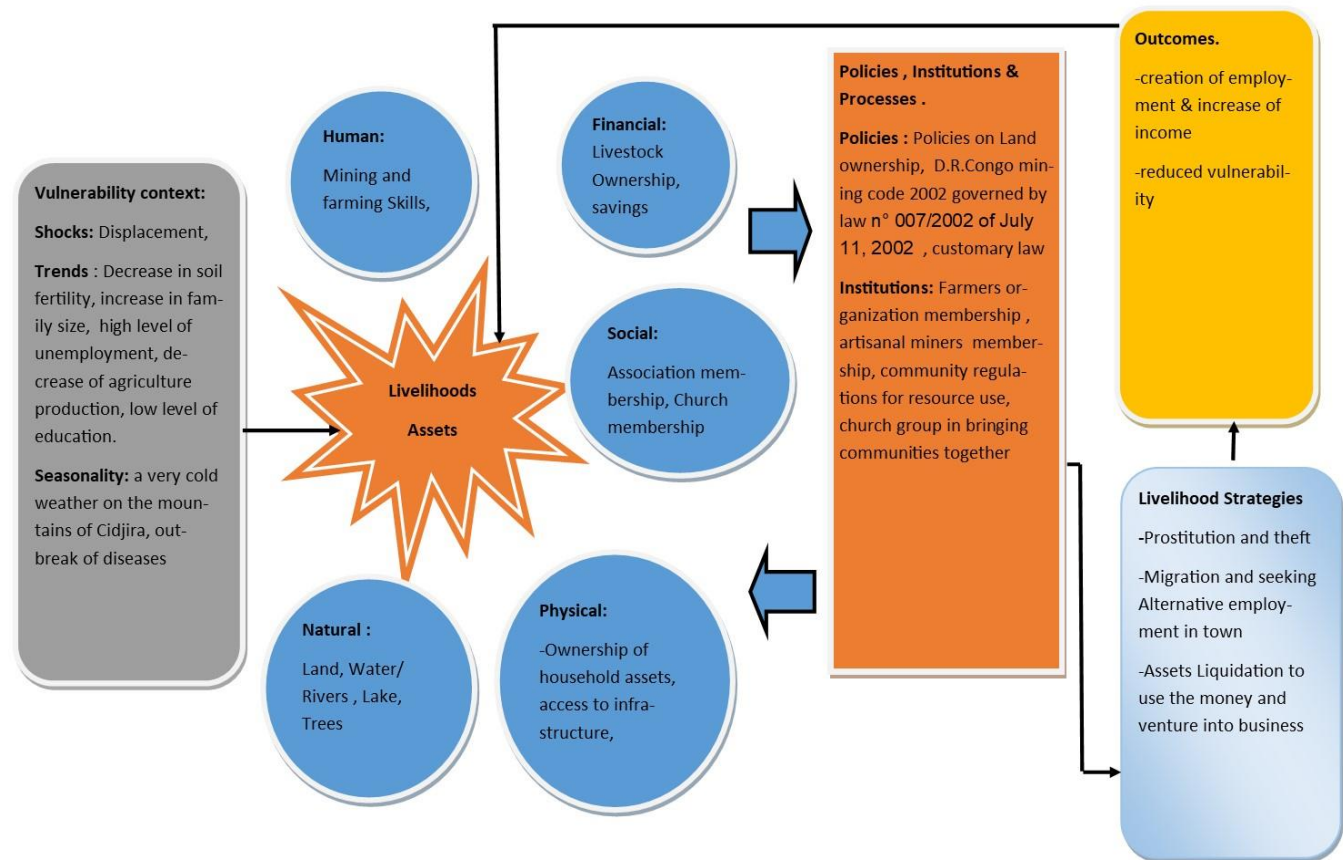
Now, most of the petty thieves were kids, but some ladies, including some girls, turned to prostitution. However, this was partly a result of the fact that BANRO employed foreign nationals. (Respondent 4, Key informant) claims that *“some women even started prostituting to BANRO staff because their husbands were no longer obtaining money from artisanal mining.”*

4.6.4 School drop-out

Dropping out of school were considered as a strategies to use in order to reduce expenses by not pay school fees and using children to help their parents in different task either selling different item at the market or working with their Parent in kaduma mining which was considered less productive.

“ I can not pay school fees for all my 6 children and feed them at the same time, the best thing to do is to give my young girls for marriage and the boys should start coming with to dig gold or help their mother” (Respondent 5)

Figure 4 : Adapted Sustainable Livelihood Framework



Source: Mushayuma,(2022)

the adapted SLF in Figure 4, summarizes research question four which was to determine the vulnerability of the people in Luhwindja; it also answers question 3 by showing how much livelihood assets were impacted by industrial mining. People of Luhwindja have different assets necessary for their means of living. The Sustainable Livelihood Framework perfectly explains the results while addressing the vulnerability context, livelihood asset, strategies, and outcomes.

4.7 Strategies in other localities that could be used in Luhwindja.

4.7.1 A win-win situation used in Kibali gold mining proposed by our respondents

Kigali Mining is a South African based gold mining company that is operating in DR Congo, the mine Kibali was named after Kibali river based in the same province where the company is operating. "When Kibali started operating in DR Congo they built schools for the local community since the majority of the people were uneducated, they also didn't stop them from mining but came in an agreement that a small portion was to be left for the local community instead of chasing them away and leaving them with no other means of survival." (key informant 4)

One of our key informant suggested that : *"if the same strategies that were used by Kigali would be used here in Luhwindja, then we wouldn't have less educated children, a high level of unemployment among youth and they will be no conflict between BANRO and the local community"* (Key informant 2)

The majority of respondents agreed with our key informant that "both industrial and artisanal mining should be developed in Luhwindja, this should be viewed as following the *"win-win principle"* in order to *"make the population comfortable like Kibali mining did"* (key informant 1).

"Because it was one of the most crucial activities for human survival in Luhwindja, the state must leave a separate area for people to engage in artisanal mining when it wishes to extract minerals. We are currently concerned that we will perish from hunger". (Focus Group discussion 1,).

"We have brothers who were working in mines in Kibali when the industrial mining company came, they left a separate area for people who were engaged in artisanal mining as it was the primary source of income for most household and built schools for the community, this alone has allowed the company to have no problem with the locals" (Focus Group Discussion 2).

4.7.2 Promotion of education by building schools

Most people in Luhwindja do not go to school, some by choice and other by lack of means, this has been a cause of a high rate of school abandon even before the arrival of Banro in Luhwindja. Also most schools were built in a far distance where people are not farming or digging gold which was a problem for most children to reach in school on time when it is raining since Luhwindja is a mountain area.

"Our wealth in mineral resource has caused people to choose digging gold than being in school, no wonder you will see so many uneducated people in Luhwindja" (Focus Group Discussion 1)

"... if BANRO could build us nearby schools and even one professional school where people can learn how to do other professional work, because besides mining and farming we don't know anything else to do..." (Focus Group Discussion 2)

"Kibali built school for the locals, now locals are involved in business, bakery and so many other professional activities, if BANRO could do that, we would be in peace with them" (Focus Group Discussion 1)

CHAPTER 5. DISCUSSION

5.1 Introduction

This chapter discusses the result of the findings on the effects of industrial mining on livelihood in Luhwindja while using the information in the literature review in chapter two. The SLF(Sustainable Livelihood Framework) was used to discuss the analysis of the vulnerability context of the people and the impact that industrial mining has on their household livelihood assets. Finally, the discussion ends with a critical reflection from the researcher.

5.2 Vulnerability context impact on household livelihood in Luwhindja.

The results and findings in Chapter four highlighted that the vulnerability of the people in Luhwindja is due to different Shocks, trends, and seasonality; while the community was already vulnerable before the arrival of BANRO, the present study found out that the decrease in agricultural yield, the suspension of informal mining, and the displacement of the population made the people more vulnerable.

According to DFID (1999), a livelihood is sustainable when it is resilient in the face of external shocks and stresses, does not depend on external support, maintains the long-term productivity of natural resources; and does not undermine the livelihoods of others. In Luhwindja, people suffered from different external factors like shocks, trends, and seasonality. During the interviews, our respondents highlighted that they were displaced from their homes and were suspended from doing their daily livelihood activities; this was a shock to them. For decades, artisanal mining has supported households alongside agriculture, these were considered to be the primary livelihood activities in Luhwindja, but the coming of Banro's Twangiza gold mining, with clear government support, led to the displacement of the people, leaving formers and artisanal miners with few options for a living. (Geenen, 2014a).

5.3 Impact of industrial Mining on Household livelihood Assets

Even while industrial mining has been shown to have detrimental effects in many nations, it has been linked to a variety of positives for livelihoods. These advantages consist of but are not limited to: promoting numerous alternative livelihoods, expanding the market for farm products, funding education, and compensating landowners, and employment and revenue can be generated. For instance, the expansion of industrial mining in Ghana resulted in the creation of 15,000 jobs by 2003. (Banchirighan, 2006). Additionally, organized mining has made it possible for nearby villages to produce by engaging in a variety of other sources of revenue (Adjei, 2007). This may be seen in Ghana, where private mining corporations compensated farmers whose farmlands were taken over by miners so they could engage in alternative economic pursuits (Adjei, 2007:69).

Different training in manufacturing soap , raising livestock and palm oil extraction were given to these farmers. Additionally, impacted farmers received microcredits and training in financial management (Adjei, 2007).

Despite its advantages, industrial mining has in many places put the lives of the poor at risk. While creating fewer jobs, industrial mining has frequently harmed the natural capital asset base of local livelihoods, including grazing and farming land as well as water.

Additionally, industrial mining has a tendency to damage the very alternative livelihoods that it had previously supported after mining closure. For instance, the closing of mines in Ghana raised serious

other forms of employment reduce them by roughly 50% (Temeng and Abew, 2009). After the mines shut down, farmland that had been lost to industrial mining began to grow again.

could not be made up for, and people's trading operations saw a decrease in demand. As a result, many got idle and didn't want to resume informal mining.

Due to the suspension of artisanal mining, many people not only lost their salaries in Luhwindja but were also unable to find other sources of income. Some men migrated to the city to look for jobs, since they were no longer able to care of their families, this migration had an impact on their human capital and social capital. One of the coping strategies that were used in the community that reduced the level of mutual trust was theft. Social capital depends on community members' mutual trust (Fu, 2004). Many people were asked to sell their land at a very low price; others sold their cattle to survive.

In terms of physical and human capital, there were some sound effects, though, as some people could purchase other assets, such as motorcycles for transport enterprises, while others were trained and hired to work for BANRO through a third party. However, they were earning way much less than actual BANRO employees who were directly employed by BANRO as highlighted by some of our respondents.

According to Gamble and Prabhakar (2005:4), acquiring and accumulating diverse assets is a crucial "means of encouraging economic and social growth" Diga (2007:12) emphasizes this by stating that "assets can better explain how and why some families migrate in and out".

5.4 Reflection as a researcher

Conducting Research has not been an easy task for me as a researcher; while conducting my research, I learned a lot, I remember when I was writing my proposal, I used to work day and night on my report, and then I forgot to save my document in one drive but it was saved in my computer, on the day that I was supposed to submit, my computer crashed, and I lost all my documents, I had to start writing my proposal all over again, that experience was really painful for me. After that, I went for data collection back in DR Congo, I took a flight from Schiphol Airport to Kinshasa, DRC's capital city; once there, I had to take another flight from Kinshasa to Goma, then a boat from Goma to Bukavu in South Kivu. The Study area was in Luhwindja, a collectivity 60km away from Bukavu. After traveling for almost a week then I reached in Luhwindja and started my data collection process. When I reflect back, I realize that I learned a lot during my data collection process in Luhwindja than when I was doing a desk study on my computer and reading different literature about Luhwindja and the effect of artisanal mining on household livelihood. I spent two more weeks trying to get an approval from the local chief and the local government which was time wasting and was never planned to be so complicated since I'm originally from the area, however I managed to get an approval and immediately decided to start collecting data by identifying my 5 Key informants.

The SLF was adapted and used as a framework to guide me in the development of my questions while conducting interviews to be able to answer my research questions.

The process of identifying 5 key informants was done using a purposive sampling method, I thought that since I don't live in the area, identifying people who live there and who would be most likely to offer acceptable data, both in terms of relevance and in-depth information would be a good idea; so I identified 5 key informant and after this, each informant were interviewed separately from the other; I still needed more information coming from different people, so I decided to conduct Focus Group discussions as planned, initially I planned to have 7 different focus group discussions of 8 people each

but I ended up having 5 different focus group discussions of 7 people each; from the focus group discussion I was able to identify 10 individual who would be helpful to proceed with an in-depth interview in their homes.

All my data was collected using different method of data collection and triangulation was used all the time to ensure the validity and reliability of the results.

During my 5 key informant interview I found out that triangulation was very important has to some had different perspective of the situation in place, however all of them were sympathizing with the people of Luhwindja by mentioning that their land was everything to them and it was taken away from them.

When I was conducting my focus group discussions I saw how much people were vulnerable through a observation and also realised that they were vulnerable before the arrival of BANRO, their displacement and the suspension of artisanal mining just made them more miserable; all 5 groups highlighted that whether or not BANRO received permission from the government to exploit the land, since it is in their home and on their land, their wellbeing should be taken under consideration as well.

Based on the findings of this Research, while acknowledging the need for further Research on the impact of industrial mining on household livelihood, I realized that both BANRO and the local community want to live in harmony and that initially, BANRO hired a small portion of artisanal miners to help them sustain for their household. Unfortunately, this was just a tiny portion, and most of them earned less than they used to earn while digging gold, as mentioned earlier. From my analysis as a researcher, after conducting interviews, focus group discussions, and observing the life of the people in Luhwindja, I came across many documents where people are advocating for their right to use some of their assets entirely, like the Lake Juba the people was not the center of this agreement to achieve a sustainable livelihood for the local community.

CHAPTER 6: CONCLUSION & RECOMMENDATIONS

6.1 Conclusion

In conclusion, it was elaborated that they were a significant impact on the household of the people in Luhwindja with the arrival of Banro; although people were already vulnerable due to different externalities, losing their assets made the situation worse, and various mechanisms were employed to cope with the situation in place.

The aim of this study was to determine the effects of industrial mining on household livelihood in Luhwindja.

According to our findings, artisanal mining and farming were considered to be the most significant livelihood activities in Luhwindja, although very few other people were involved in small businesses selling agricultural and manufactured goods at mining sites, small shops, and restaurants along the sides of the road, and small local markets.

Although some researches showed a negative impact of artisanal mining, it has been found that artisanal mining has been supporting household livelihood of the people in Luhwindja, and this was not only for artisanal miners , but also teachers were paid with income from artisanal minings, agriculture

productions were supported by artisanal mining. People built houses, invested more in their livestock and that contributed in reducing their level of vulnerability.

Industrial gold mining affected households assets in so many ways, people were asked to sold their land to Banro at a very low price , when people found themselves with no land to mine or cultivate, some resolve to migrate into the city looking for a job and left their families in Luhwindja. No long after taking over the land, Banro start dumping wastes from the industry in Lake Jubi which was considered to be a primary source of water for the population,

The vulnerability of the people was due to an increase of family size, decrease of soil fertility, a high level of unemployment, decrease of agriculture production, low level of education, etc...

Banro just made things worse; these resulted to different way of coping with the situation in place in order to survive, some people decided to sold their livestock , others to migrate in the city , the most vulnerable ones felt like they had no other choice but to turn into prostitution and theft .

Different strategies used in other localities that could harmonize interests which could be embraced by both the local communities and the industrial gold mining company in Luhwindja were proposed by our respondents stating that Banro should leave a small portion for them, that they can use both for mining and farming purposes and also that build professional schools like Kibali gold mining did since they don't enough knowledge in any other field beside mining and farming.

6.2 Recommendations

Based on the research findings in chapter 4, the researcher formulated 3 recommendations:

1. According to our findings, it is advised that TPO uses our results to understand the livelihood activities of the people in Luhwindja and how it was affected by industrial mining; however, the sample for this study was purposefully chosen and did not reflect all of the homes in Twangiza. Therefore it cannot be said that the majority of people's activities were impacted with industrial mining. That conclusion can only be drawn from surveys like OGP did in 2008, so our recommendation will be to conduct a survey, this can be done by identifying 10 people in Luwhindja who can participate in data collection while involving 10 locals in collecting data from 200 people, this survey will be done in 2 days using a set of questionnaires where they will put comments and complete the questionnaire while conduction interviews, a triangulation method will be use and each person will receive one questionnaire related to people's livelihood activities and how this was affected by industrial mining with this survey TPO will be able to understand the livelihood of the people and how this was affected by industrial mining.

2. After the survey, an analysis of the data collected will be suggested in order to use the findings and recommend possible collaboration between BANRO and the people in Luhwindja to support their livelihood. This will be done in a period of 1 week by identifying by a team of 10 people as well using Microsoft Excel to analyse and interpret the data.

3. Finally we would recommend TPO to use our findings and the findings of their Survey to develop livelihood strategies that could harmonize the interest of local communities and Banro, which could be embraced to support household livelihoods in Luhwindja, however as a researcher according to our findings different strategies are being proposed :

- Banro can employ the locals after training them and let them benefit from all the benefit that BANRO gives to its employees and not use a third party to employ local people of Luhwindja; this will allow people to earn more and increase their income.
- Banro can leave a small portion for the people to utilize out of the 2600km, as some of our respondents were suggesting.
- Banro can build schools for the community as suggested by some of our respondents since illiteracy is very high in the area and there are very limited schools available; also, there is no anything like a professional school in Luwhindja where people can learn do to other professional work that can support their household livelihood.
- TPO being the commissioner of the study can propose Banro to partner with them in supporting people's livelihood by training them into different professional work.

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APPENDIX

Appendix 1:Time Planning

Key Stage	Activities	Periods
Desk Study	Problem identification Research Objectif Research Questions and Sub-questions Literature review Methodology Data collection material preparation Litterature Study and Preparation for data Collection	4 weeks starting from June
Traveling to Congo	Traveling to Congo and Preparing to travel to Luhwindja	1 st Week of July
Getting permission to conduct Research in the area	Organizing a meeting with the chief or the elders of the area to get the permission of conducting Research Identifying the Key Informants Key Informants Interviews	2 weeks from the 2 nd week of July
Data collection and analysis per method used	Focus group discussion Household Interviews and observation Traveling Back to the Netherlands	1 week, (Last Week of July) The first 2 weeks of August 3 rd Week of August
Thesis report Writing	Results of Data collected and analysed Discussion of findings Peer Review of report Conclusion and Recommendation	Last Week of August and the First 2 weeks of September
Thesis report submission	Final review of report before submission	

Appendix 2: Profiles of participant of the households interviews and their livelihood assets

Household (HH)	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10
<i>Size</i>	8	10	9	6	7	8	9	8	6	5
<i>Occupation of the head of household</i>	Small Business	Informal Mining	Informal Mining	Informal Mining	Farmer	Farmer	Informal Mining	Farmer	Famer	Small Business
<i>Income per month in USD</i>	100\$	400\$	500\$	350\$	200\$	160\$	300\$	250\$	200\$	100\$
<i>Primary Income</i>	Business 80\$	Informal Mining	Informal Mining	Informal mining (250\$)	Farming	Farming	Informal Mining (250\$)	Farming	Farming	Business 70\$
<i>Secondary Income</i>	Farming 20\$	None	None	Farming (100 \$)	None	None	Farming (50\$)	None	None	Farming 30\$
<i>Secondary School Completion</i>	3	None	None	None	1	2	None	None	2	1
<i>Numhber of people who are working</i>	2	1	1	2	1	1	2	1	1	2
<i>Livelihood Assets</i>	House, small plot of farming land, 5 goats, 10 pigs	5 goats, land, house , 1 cow	One motobike, 10 rabbits,	7 Pigs, 3 cows, house	One plot of land cultivating casava and beans, house , 10 goats	20 chickens, house, plot of land, 3 Pigs	Plot of land , house, banana farm, 10 pigs	20 Pigs, 3 cows , 10 chickens, land and a house	5 cows, a farming land cultivating bananas, one house,	1 small shop, land, a house, 2 cows and 5 goats

									beans and casava	
Primary Asset source	Small Business	Informal Mining	Informal Mining	Informal Mining	Farming	Farming	Informal Mining	Farming	Farming	Small Business
Secondary Asset Source	Farming	None	None	Farming	None	None	Farming	None	None	Farming

Source: Mushayuma,(2022)

Appendix 3: Interview guide for Key Informants Interviews

Date: / / 2022

Good morning, thank you so much for your time, my name is Mushayuma Ntakobajira Homer. I am doing a Master in Management of development with a specialization in food and nutrition security. As a partial fulfilment of the requirements for the degree of Master, I m currying out a research in a topic of my interest, being originally from Luhwindja I decided to curry out my research in Luwindja. I kindly requeste for your participation in this research by answering a couple of questions which will help me answer my research question and understand the effects of industrial gold mining on households' livelihoods in Luhwindja. The information collected will be used for academic purpose and will be treated with confidentiality, this information will also be useful to the commissioner of this research to develop a livelihood strategy to support Vulnerable people in Luhwindja.

SECTION A: INFORMATION ON PARTICIPANTS

1. Gender:

Male	Female

2. Status of the key informants:

Local government Officer	Customary Chief	Catholic Priest	Banro employee

SECTION B: RESEARCH QUESTIONS

a) What were the livelihoods activities in Luhwindja, South Kivu Province, DRC before the arrival of Banro in 2011?

1. What is the educational level of the majority of people in Luhwindja ?
2. What were the primary source of income of the people in Luhwindja before the arrival of Banro?
3. How were these activities affected with the arrival of Banro?
4. What are the most common livelihoods activities that people are doing now as a way of supporting their household and recover from the shock due to the arrival of Banro?

b) What are strategies in other localities that harmonize interests which could be embraced by both the local communities and the industrial gold mining company in Luhwindja, South Kivu Province, DRC?

1. Is there other localities that were affected by industrial gold mining previously?
2. If other localities were affected by industrial gold mining in the past, what strategies did they use in order to live in harmony with the industrial gold mining company?
3. Can those strategies be implemented in Luhwindja?
4. Can you recommend a strategy that can be used to bring harmony among local communities and industrial gold mining company in Luhwindja?

c) What is the vulnerability context of people in Luhwindja, South Kivu Province, DRC due to industrial gold mining?

1. What made people vulnerable and limited their capacity to avoid, resist, cope, or recover from harm?

2. Do people still have access to their assets?
3. What is the external factor that affected their assets and capacity to resist or cope from the shock received due to industrial gold mining?
4. What stopped people from using and accessing land?
5. How did they acquire their land?
6. What are the challenges that they faced due to industrial mining?
7. Do people receive support from NGOs, political parties or loan from a financial institute?

Thank you for your participation

Appendix 4: Interview guide for Focus Group Discussion (FGD)

Date: / / 2022

Good morning, thank you so much for your time to participate in this focus group discussion, my name is Mushayuma Ntakobajira Homer. I am a doing a Master in Management of development with a specialization in food and nutrition security. As a partial fulfilment of the requirements for the degree of Master, I m currying out a research in a topic of my interest, being originally from Luwindja I decided to curry out my research in Luwindja. I am kindly requesting for your participation in this research by answering a couple of questions which will help me answer my main research question and understand the effects of industrial gold mining on households' livelihoods in Luhwindja. The information collected will be used for academic purpose and will be treated with confidentiality, this information will also be useful to the commissioner of this research to develop a livelihood strategy to support Vulnerable people in Luhwindja .

SECTION A: INFORMATION ON PARTICIPANTS

Status of the focus group discussion participants:

Youths	Women	Farmers	Artisanal Miners

Number of participants:

SECTION B: RESEARCH QUESTIONS

a) What is the effect of industrial gold mining on household livelihood assets in Luhwindja, South Kivu Province in DRC?

1. Is Banro the first Industrial gold mining in Luhwindja?
2. Is Banro the only Industrial gold mining in Luwhindja?
3. What are your primary household livelihood assets?

4. Were your assets affected by industrial gold mining?
5. What is your main source of income?

b) what was the effect of artisanal gold mining on household's livelihoods in Luhwindja, South Kivu Province, DRC?

1. How did u get involve in artisanal gold mining?
2. Where you doing another work to support your families or being a miner was your only work ?
3. How many people are also working in your households?
4. How many miners are in your households?
5. What is the list of your assets (human capital , Financial capital , Natural capital , Social capital and Physical capital) ?
6. What are your source of income?
7. What livelihood activities are you doing now to support your household?
8. Do you receive support from any NGO, political party, church or any other organization?
9. How many people were involve in artisanal mining among household in Luwhindja?

Thank you for your participation

Appendix 5: HOUSEHOLD INTERVIEW GUIDE

Date: / / 2022

Good morning, thank you so much for your time to participate in this household interview session to collect information for our research. My name is Mushayuma Ntakobajira Homer. I am a doing a master's in management of development with a specialization in food and nutrition security. As a partial fulfilment of the requirements for the degree of Master, I am currying out a research in a topic of my interest, being originally from Luwindja I decided to curry out my research in Luwindja. I am kindly requesting for your participation in this research by answering a couple of questions which will help me answer my main research question and understand the effects of industrial gold mining on households' livelihoods in Luhwindja. The information collected will be used for academic purpose and will be treated with confidentiality, this information will also be useful to the commissioner of this research to develop a livelihood strategy to support Vulnerable people in Luhwindja.

SECTION A: INFORMATION ON PARTICIPANTS

a) Gender:

Male	Female

b) Activity of the participant:

c) Household size:

1-4 people	4-8 people	8-12 people	Above 12

SECTION B: RESEARCH QUESTIONS

a) What is the effect of industrial gold mining on household livelihood assets in Luhwindja, South Kivu Province in DRC?

1. What is the primary asset that support your household livelihoods?
2. How much were your assets affected by industrial mining?
3. Do you receive any support or help from the government, NGOs, political parties , churches , or any other institution ?
4. Do you have access to credit or loan?
5. Do you still have access to your primary assets?

b) What is the vulnerability context of people in Luhwindja, South Kivu Province, DRC due to industrial gold mining?

1. What made you vulnerable and limited your capacity to avoid, resist, cope, or recover from the shock due to industrial gold mining?
2. Do you still have access to your land?
3. What are the challenges that you faced due to industrial mining?
4. What is the external factor that affected your ability to recover or cope from the shock due to industrial mining?
5. What livelihood activities are you doing now as a way of supporting your household ?

Thank you for your participation

Appendix 6 : Observation Checklist

Date: / / 2022

What to observe	Comment
a) What were the livelihoods activities in Luhwindja, South Kivu Province, DRC before the arrival of Banro in 2011?	
Compare the information given by each key informant to ensure the validity and reliability of the information	
b) What is the effect of industrial gold mining on household livelihood assets in Luhwindja, South Kivu Province in DRC?	
Financial Capital: Livestock own by farmers Credit facilities Income generation	
Physical Capital The kind of house that people are living in Owning durable assets such as vehicle and motorcycle	

Natural Capital Land owned and access to land	
Human Capital Human capabilities such as education level Extension workers	
Social Capital: How people in Luhwindja support each other and how they are supported by other organization like NGOs, churches , political parties etc...	
c) What is the vulnerability context of people in Luhwindja, South Kivu Province, DRC due to industrial gold mining?	
Proximity of source of Water Proximity to the road and market State of affected livelihood assets External factors that are affecting people's ability to cope or recover from the shock due to industrial mining	

Appendix 7: Advocacy letter against BANRO for dumping their waste in Lake Jubi with close to 100 Signatures of the local community

REPUBLIQUE DEMOCRATIQUE DU CONGO

PROVINCE DU SUD-KIVU

TERRITOIRE, bE MWENGA

CHEFFERIE DE LUHWINDJÀ

VILLAGE DE KANTAMBWE

Mémoire adressé à Monsieur le Directeur Général de la Société
Twangiza Mining S.A. à Luhwindia.

Objet : Relocalisation

Contexte et justification

Depuis l'implantation de l'usine d'exploitation de la mine d'or sise à Kaliba/Namihombo, en chefferie de Luhwindja, la population riveraine habitant dans le village de Kantambwe est confrontée à plusieurs problèmes tant socio-économiques qu'environnementaux. Cette situation est due à plusieurs causes dont la proximité avec le lac des rejets des résidus toxiques provenant de l'usine de traitement d'or qui est située à quelques mètres des habitations des paysans, et cela depuis l'année 2017.

En effet, il y a maintenant 5 ans que la population de Kantambwe vit un calvaire qui se traduit par :

- a) Une pollution de l'air dans le milieu, caractérisée par une odeur nauséabonde, avec comme conséquence des cas de maladies respiratoires et cutanées qui s'observent avec récurrence chez plusieurs habitants de Kantambwe ;
- b) Une pollution sonore due aux bruits des machines et détonation des dynamites que la compagnie Twangiza mining fait exploser au moins 2 fois par semaine, avec comme risque d'être victimes des maladies cardiaques ; 3
- c) Destruction des puits et sources d'approvisionnement en eau potable avec aussi comme risque la contamination des maladies d'origine hydrique, comme le choléra, ceci à cause des travaux de grande intensité qui se font par des engins et machines de la compagnie aux alentours de ces sources d'alimentation de l'eau ,

- d) Accès quasi-impossible vers les centres d'approvisionnement en de 1^{ère} nécessité à cause la coupure de voies de communication routière. cas notamment rotés. menant vers Nyorha, Chinjira, Chibanda, Bugumya qui sont coupées de Kantambwe, rendant ainsi l'entrée et la pour tous les habitants, 'e surtout les élèves qui éprouvent pour aller à l'école et même les malades et les femmes difficilement au centre de santé de Luchiga à cause de cette situation
- e) Impossibilité de pratiquer de l'élevage à Kantambwe par crainte de noyage de nos bétails dans le lac de rejet ;
- f) Circulation très difficile à l'intérieur de Kantambwe à la suite de plusieurs trous . creusés au cours de l'exploration du site par la société, mais qui malheureusement, n'ont jamais été remblayés jusqu'à ce jour.

2. Nos attentes

Eu égard à ce qui précède, la population de Kantabwe recommande ce qui suit :

- a) Que, conformément à la loi no 007/2002 du 11 Juillet 2002 portant code minier et le décret no 038/2003 du 26 mars 2003 portant règlement minier ainsi que tous ses annexes, à être relocalisée dans l'immédiat à un autre site où il fait beau vivre; ceci à l'instar des populations de Chibanda 1^{er} et Bugumya récemment relocalisées, pour éviter que le pire n'arrive ;
- b) Que la compagnie finalise le processus d'enquête et/ou recensement de tous les ménages de Kantambwe, et cela sans aucune discrimination de

quelle que nature que ce soit.

Veillez agréer, et recevoir Mr. le Directeur Général, l'expression de nos sentiments de haute considération.

Fait à Kantambwe/ Luhwindja, 06/05/2022.

Pour la Population de Kantambwe (voir liste en annexe).

C.C :

- A sa Majesté le Mwami Naluhwindja Chef de Chefferie de Luhwindja à Luhwindja ;
- Aux honorables députés provinciaux du Territoire de Mwenga (Tous à Bukavu) ;
- A Monsieur le Modérateur du Forum Communautaire de Luhwindja (FCLu) à Luhwindja.
- Au représentant de l'organisation Association du Barreau Américain (ABA-ROLI) à Bukavu ;

POPULATION DE KANIARUBWA

No	NOMS & POST-NOMS	FONCTION	Sexe	No TEL	Signature
	MIGAMBI - MIROHA	Cultivateur.	M	0971012027	
	MUSHAGALI - LUMBOSHI	Cultivateur	M	0990302501	Bug
	BAGUMA - MIGAMBI	Cultivateur	M	09776577	97 km
	KAPIRIPIRI - MIGAMBI		M		
	BAGALWA - MIROHA		M	0979047255	
	MUSHAGALI - BAGALWA		M	0974985276	
	CHIBALWIRA - MIROHA		M		
	Bihamba Micabi		M		
	B Chendwa - Nkingi		M	0974624286	
	NTAMWIRA - Nkingi		M		
	TORO - SUNGU		M	0993680876	
	BHESHAMWA		M	0979237768	
	BASHORBE - KAPOHO		M	0976778138	
	BASHINBE KARWANGAT		M		
	BARIZE - MULANGA		M		
	MUBALAMA - MULANGA		M	0975690012	
	BAGAJE - MURU		M	0973849299	
	CHIMANA ZIHARU	Enseignant	M	0972398560	
	NTAKWAGE - KAYUNGI		M		
	SAFARI - RUMYAJA		M	0991465353	
	BALEKE NTAKWANGE		M	092312900	
	CHIZUNGU - CHIRABA		M	0995071785	
	MUBALAMA - CHINKENYI		M	0994786326	
	BARAME - MOR		M	0977538204	
	Mulega - Lufajo		M	0971604345	
	MUBADA - Lufajo		M		
	NTAMUSHIGU - GAKULAMAGA		M		
	Balumwe - KAHUJIMA - FILIPO		M	0970707474	

60	BARHAMU KARHWANGA	M	11-11-11-	
61	NAKANGU M'CHIRHOGERA	F	11-11-11-	
62	BITA KAYUNGIYO	M	11-11-11-	
63	NANKAFU M'BITENZI	F	11-11-11-	
64	BUSIME M'SUNZU	F	11-11-11-	
65	NANKAFU M'CHINKENYI	F	11-11-11-	
66	KANABANA MORO	F	11-11-11-	
67	AKONKWA M'ALTONSI	F	11-11-11-	
68	NSHOBULE M'KAMOLA	F	11-11-11-	
69	FAHA M'NANTANGA	F	11-11-11-	
70	FRANCINE M'MENA	F	11-11-11-	
71	FAHA MPIGIRE	F	11-11-11-	
72	KANABANA BAHANE	F	11-11-11-	
73	MUGISHO MAKAMBA	F	11-11-11-	
74	NTAKWINAJA M'CHINDANALE	F	11-11-11-	
75	BISIMWA CHISHEBULE	M	11-11-11-	
76	MUSEMWA SHESHEMWA	M	11-11-11-	
77	CHIRHUZA NTAKWAGE	M	11-11-11-	
78	MSAFIRI NTAKWAGE	M	11-11-11-	
79	NANKAFU NTAKWAGE	F	11-11-11-	
80	MSHABALUSA CHISHEBULE	M	11-11-11-	
81	MUSA SHESHEMWA	M	11-11-11-	
82	CHABASHIMBA KARHULO	M	11-11-11-	

Pour la population de kantambwe :

Nom :

- 1) BYAMUNGU NTA MUSHEGO ~~NTA MUSHEGO~~
- 2) MSAAA M'KAMOLA ~~NTA~~
- 3) NSOROWE M'KAMOLA ~~NTA~~
- 4) SALOME ~~NTA~~
- 5) NSIMINE MARUY ~~NTA~~
- 6) MSHAGHUSA GANGWAMUHUME ~~NTA~~
- 7) NTA KOBASIRA BAHIGE ~~NTA~~
- 8) ZIRINGA M'KALISA ~~NTA~~
- 9) MURHABZI NABULUNDA ~~NTA~~
- 10) BALEKEMBAKA-NTAKWAGE ~~NTA~~
- 11) FAIDA M'MWANGASI ~~NTA~~
- 12) NTA KWAGE ~~NTA~~
- 13) MUNKWA BARHAME ~~NTA~~
- 14) MWANGAZA BATUNGAMBA ~~NTA~~
- 15) AKI TOWA MPANZI ~~NTA~~
- 16) CHIMALA - ZITALIRWA ~~NTA~~
- 17) BARHALIBORHU ~~NTA~~
- 18) BUSIME CHIRHUA ~~NTA~~
- 19) BULO ~~NTA~~
- 20) KWINATA KAHIGE ~~NTA~~
- 21) MBWINE - BAHIGE ~~NTA~~
- 22) NEEMA - MBWINE ~~NTA~~
- 23) BISIMWA - MIGAMBI ~~NTA~~
- 24) CHIREZI MIMULAMBA ~~NTA~~
- 25) BAGATE MORO ~~NTA~~
- 26) MAOMBI ZAHINDA ~~NTA~~
- 27) NEEMA - BISIMWA ~~NTA~~
- 28) FARAJA KAJAGA ~~NTA~~
- 29) BASIMARHA NATANGA ~~NTA~~
- 30) BAHATI BAHANWA ~~NTA~~

Appendix 8 : Pictures

















