THE SOCIAL AND ECONOMIC IMPACT OF THE ARTISANAL AND SMALL-SCALE GOLD MINING ON THE DEMOCRATIC REPUBLIC OF CONGO ECONOMY: CASE STUDY OF ASGM COOPERATIVES IN ITURI PROVINCE (2014-2024)

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J21/M15/009

A DISSERTATION SUBMITTED TO THE SCHOOL OF BUSINESS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION OF UGANDA CHRISTIAN UNIVERSITY

May,2025

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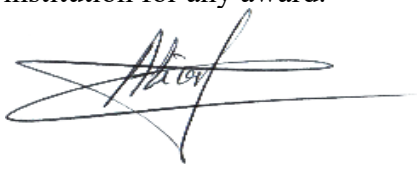
DECLARATION

I, ALIANG'O THUMITHO Alphonse, declare that to the best of my knowledge, this dissertation thesis is my original work, is not plagiarised and has never been submitted to any institution for any award.



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APPROVAL

This dissertation is hereby submitted with my approval as a University Supervisor KASOZI Geoffrey.

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DEDICATION

This research is dedicated to my beloved parents, Mr. and Mrs. NGBACHULU; and my sisters and brothers, and to all my siblings who have contributed immeasurably to my studies. I really appreciate your prayers and support. May the Almighty God richly bless you all! Secondly, to you my academic supervisor Dr. KASOZI Geoffrey let me take the opportunity to express my profound gratitude for your guidance, advice and prompt feedback. You have really made me a better person in the field of academia. Finally, to all artisanal and small scale gold mining cooperatives community members and other stakeholders contacted during my fieldwork in Ituri Province of the Democratic Republic of Congo, it was a pleasure working with you and benefit from your supports.

ACKNOWLEDGEMENTS

"If it had not been the LORD who was on our side…" (Psalms 124:1-8 King James Version). I first of all thank the Lord Almighty, who gave me abundant health, strength, and courage to be able to complete this work.

Secondly, my heartfelt gratitude goes to my Supervisor Dr. Kasozi Geoffrey for his tireless commitment and guidance to materialise this piece of work. By the same token, I wish to express gratitude to all lecturers and staff in the MBA Program from the School of Business and Administration for their contribution in various ways to make my journey to MBA studies a success. With a thankful heart, I want to show my utmost appreciation to all artisanal and small scale gold mining cooperatives corporation, Ministry of Mine and its SAEMAPE staff for showing interest and playing a crucial role in reshaping this Research project. My joyful heart goes for you all.

Finally, special thanks go to my family, parents, brothers and sisters for their tolerance, patience, encouragement, and sacrifice throughout my struggle for this academic achievement. They have never lost hope in me.

All I can say is may the Almighty Lord increase you in the knowledge of His Will.

Aliang'o Thumitho Alphonse.

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LIST OF ABBREVIATIONS

ASGM Artisanal and Small Scale Gold Mining

ASM Artisanal and small Scale Mining

3T Tin (cassiterite), Tungsten (wolframite), and Tantalum (coltan)

BGR Bundesanstalt für Geowissenschaften und Rohstoff (Federal Institute for Geoscience and Natural Resources of Germany)

AU African Union

CVI Content Validity Index

DV Dependent Variable

IV Independent Variable

DRC Democratic Republic of Congo

ECLAC Economic Commission for Latin America and Caribbean

EIA Economic Impact Analysis

EITI Extractive Industries Transparency Initiative

ESIA Environmental and Social Impact Assessment

FDI Foreign Direct Investment

GDP Gross Domestic Product

GNI Gross National Income

ILO International Labour Organization

IMF International Monetary Fund

MMSD Mining, Minerals Sustainable Development

OIM International Organisation for Migration

RGMP Responsible Gold Mining Principle

RSA Republic of South Africa

SAEMAPE Service assistance et d'Encadrement Minier Artisanal à Petite Echelle (Office for assistance and management of artisanal and Small-Scale mining)

SDG Sustainable Development Goals

SIA Social Impact Analysis

SOKIMO Société des Mines d'Or de Kilo Moto (Kilo Moto Gold Mines Company)

UNHABITAT United Nations Human Settlements Programme

VAT Value Added Tax

WB World Bank

WGC World Gold Council

ZEA Zone d'Exploitation Minière Artisanale (Artisanal Mining Zone)

ABSTRACT

This research thesis targeted to give a unique and significant evidence of the social and economic contributions concerning the impact of ASGM cooperatives business in Ituri province/ DRC on the Country development and economic growth. Specifically, four objectives were addressed in a series of questions that investigated: (i) the nature and processes of the Artisanal and Small Scale Gold Mining (ASGM) cooperative activities in Ituri Province/DRC; (ii) the ASGM cooperatives impacts on the socio-economic transformation both in terms of contributions and shortcomings ; (iii) the challenges encountered by ASGM cooperatives in contributing to their artisanal gold mining activities; (iv) the opportunities and possible alternatives to enhance and make more sustainable the ASGM cooperatives to boost the socio-economic progress. Semi structured questionnaires, interviews, observation and photography were employed to address the set objectives. In the rendez-vous, were quantitative and qualitative data analysis engaged via statistical package for social scientists and microsoft excel whereas inferential data analysis on IV & DV was done first via Pearson correlation to test the correlation level and secondly through Anova regression to measure their significance.

Research results confirmed ASGM cooperatives activities as driver of the economic growth through creation of employments, tax payment, its effect on living standard and income, contributions to build the province through housing sector, trade and investment plus supplementary initiatives to shape the trade and investment in the region. In addition to the social development aspect, ASGM cooperatives hands were seen in contributing to rehabilitate a number of roads, schools and bridges infrastructures including contributions to develop sports and charities. A number of side effects of ASGM cooperatives activities were recorded vis-à-vis environmental concerns on fauna, flora and human health in the region. Following numerous challenges facing the ASGM sector in Ituri, the research advocated for the security and peace to be restored in Ituri especially around the mining sites, modern gold refinery to add value to the minerals for more economic benefits, trainings, tax alleviation and subsidies to ASGM sector and plan for after gold mining activities intended for both communities living around gold mining sites and gold dealers.

CHAPTER ONE
INTRODUCTION AND BACKGROUND

1.1 Introduction of the study

The Democratic Republic of Congo has substantial untapped gold, cobalt, diamond, lithium uranium, coltan, manganese and copper reserves, but similarly with high insecurity emphasized by a lack of adequate infrastructure. These constrains confine the country mining industry to rely mainly on artisanal and small-scale mining (ASM) for extraction than large scale gold mining (LSGM). According to US International Trade Administration 2024, the DRC was the 2022 world's largest cobalt producer with an estimation of 130,000 tons, approximately 68 percent of the world's cobalt production, the fourth largest manufacturer of industrial diamonds in 2022 with a production of 4.3 million carats. The country's gold mining sector is also witnessing high interest from mining companies with the production of mining resources increased from 10,000 tons to nearly 1 million (US International Trade Administration 2024).

Large contributions from the artisanal and small scale miner cooperatives have therefore facilitated the DRC mining sector to maintain that level of production. The core mineral resource deposits are mainly concentrated in eastern and southern part of DRC provinces like gold in Haut-Uele and Ituri Provinces, copper and cobalt in Lualaba and Haut Katanga. Hence, DRC's ASM mineral resource extraction (Gold, copper, nickel, tantalite, cobalt, zinc, diamonds…) refers to mining activities that use simple methods to extract and process minerals on a small scale using picks, hoes, chisels, large shovels, sluices for gold purification, jackhammer, low pressure pump machine, small stone crusher and others. Then its labour force characteristics are not commonly and formally trained. Besides, their mining operations are usually informal.

In Ituri Province, ASM involved in gold mining business takes the leading economic activity. It has contributed not only to wealth creation but also to provide an avenue for employment, source of livelihood to lots of households, as well as government revenue. Several efforts have been made by DRC's Government to control, develop and shape the ASM sector in Ituri province to drive the country economic growth, is far from reality.

It was against this backdrop that the research was carried out to investigate the socio-economic impact of ASGM activity in a particular area of the Democratic Republic of Congo identified as Ituri province where artisanal gold mining business was predominant.

1.2 Background of the Study

In the Democratic Republic of Congo, artisanal and small scale mining have had a long history of widespread economic importance since the country independence time 1960. According to Sidorenko et Al. (2020) : " Artisanal and small scale mining can be defined as manual and poorly mechanised and perceptibly characterized by low levels of capital expenditure, low technology usage and high levels of labour intensity".

In the early days, artisanal miners primarily was focusing mainly on gold, but during the 1990s the increase in demand for tantalum, tin and tungsten drove many young people in quest of good life to further diversifier the sector in the different provinces in the country. Today, artisanal mining has extended its activity to gold, cassiterite and diamond in Ituri Province.

Following the zaïrianization 1972, state ideology with authenticity campaign to rid the country of the lingering vestiges of colonialism and continuing influence of western culture, Artisanal Mining was liberalized on 1th April 1982 as remedy to respond to the series of economic and social challenges in the country. This period marked the beginning of the artisanal and small-scale mining (ASSGM) corporation as legalized and authorized business in the Democratic Republic of Congo.

In order to respond to the series of economic and social challenges in the country during Joseph Kabila period in office (2001-2018), the government authorities of the Democratic Republic of Congo took a firm directive in the forms of legislative actions especially the revision of Mining Code 2002 and diligent programs from various development partners to support the sector's development consisting of both artisanal and small-scale gold mining (ASGM) and large-scale gold mining (LSGM). Unfortunately, DRC is still stuck to materialize its policy that requires that mining companies repatriate 60 percent of mining export receipts. Documented report showed that mining companies' repatriated export

receipts could not transited through Congolese banks but ended up abroad and thus did not increase domestic deposits (IMF 2023) and its figures yet to be known.

Thus, the Revised Mining Code 2018 (Law n°18/001) of March 09th 2018 recommended that artisanal and small scale mining (ASM) Cooperatives should direct their actions towards the country economic growth and development by focusing their policies on: (i) modernizing the artisanal national identity system; (ii) laying the foundation for future productivity through improved working system; (iii) contributing to reduce the rate of unemployment in the region; (iv) empowering women and youth by providing them with the means and opportunity to contribute to and benefit from the development of the country; (v) increasing access to good-quality health services and education to build human capital; (vii) building a safety net system to consolidate the benefits of investments in human development and foster household resilience; (viii) broadening the benefits of growth through measures to support youth employment; and (ix) addressing the human impact of conflict (DRC Revised Mining Code 2018, Law n°18/001).

The above recommended policy action on ASM was aimed at achieving the most significant transformative on the DRC volatile economy. It was alleged that it will help so far to sustain strong growth rates and make good progress towards poverty reduction and public prosperity. Though the disposition in the new Mining Code 2018 chapter 26 stated that foreigners are prohibited from the artisanal exploitation and management of artisanal mineral resources by limiting it to individuals with Congolese nationality, to individual foreigners that have chosen to live in the country and to legally recognized corporations headquartered in the country whose purposes involved the purchase and sale of the mineral product of artisanal mining (DRC Revised Mining Code 2018, Law n°18/001). There's some documented reports show that quite a good number of non-citizen such as Chinese nationals, South Koreans, south Africans, Kenyans, Uganda nationals continue to their gold exploitation among ASGM category in total violation of the laws. Thus the effort to protect the Congolese nationals' rights on mining sites as well as the maximization of their contribution to the country economic had become hypothetic taking the fact that most of the non-citizen do export their production and outsource their small labor force.

Consequently, the present study was diligently seeking to fill this knowledge gap by finding out the social and economic impact of ASGM activities using a case study of DRC's Ituri Province ASGM Cooperatives on a longitudinal research, because it was perceived to be contributing significantly to growth and development of country's economy despite its limited evidence about the scale of the contribution and time evolved.

1.3 Problem Statement

Following the 1982 ASM Legalisation via the Presidential Decree-Law No. 82-039 of November 5, 1982, an influx of citizen took the opportunity to endeavor into artisanal mining sites despite its casual, riskiest and rudimentary business conditions. Granting ASM with the legal land titles known as ZEA (Artisanal mining zone) was seen as a magic bullet proof through which substantial social and economic benefits can flow to ASM cooperatives members, the local communities and the government coffers.

Further, reforms undertaken through the Revised Mining Code 2018 (Law n°18/001) of March 09th 2018 were meant to more empower sector to mandatory operate under cooperative canopy known as ASM cooperative, with special milestone to safeguard and advance their mining operations in order to maximize the revenue hence improving RDC infrastructures development and economic growth. Despite a number of instigated reforms aimed at creating a conducive environment for business boom, the socio-economic impacts of ASGM cooperative activities were not felt by the communities on average in terms of better housing, increased tax revenue collection, improved income standard and enhanced employment opportunity.

According to some documented reports, DRC's ASM sector represents a relatively good source of income and livelihood in the region. De Brier et al. (2020, 9) estimated in a recent study estimated that 3T (Tin=cassiterite; tungsten=wolframite & tantalum=coltan) miners earn around USD 2.7 and USD 3.3 per day in eastern DRC. However, the German Federal Institute for Geosciences and Natural Resources (BGR: Bundesanstalt für Geowissenschaften und Rohstoffe) reported that Copper and cobalt miners have an average daily income of USD 7.65. Though 40% of those miners earn less than the Congolese legal

daily minimum wage of USD 4.2, the daily rate may reach up to more than USD 50 a day (BGR 2019, 36).

From different research analysis and consultancies, a lot of works have been done studying the formalized LSGM (large scale gold mining) and non-formalised ASGM (artisanal and small scale gold mining) worldwide going from the institutions and resource governance to conflict mineral and monitoring reports. On the contrary, there was a lack of sufficient studies related to assessment of legalized ASM cooperative social and economic contributions to DRC's economy such as ASGM cooperatives in Ituri province with factual and determinant figures.

1.4 The objective of the study

1.4.1 General objective

The general objective was to assess the social and economic impact of ASGM cooperatives activities in DRC Ituri Province on a longitudinal study.

1.4.2 Specific objectives

The Specific objectives were directed:

i) To explore the nature and processes of ASGM cooperatives undertakings in Ituri Province;

ii) To examine ASGM cooperatives activities and their impacts on the social development and economic growth in DRC Ituri Province;

iii) To pin out some challenges encountered by ASGM cooperatives in contributing to the social and economic revolution in DRC Ituri Province;

iv) To identify opportunities and possible alternatives to make more secure, resilient and sustainable ASGM cooperative activities to boost the socio-economic progress in DRC Ituri Province.

1.5 Research questions

The above study's objectives were addressed by responding to the following specific research questions:

i) How organized were the nature and processes of ASGM cooperatives undertakings in Ituri Province?

ii) How did ASGM cooperatives overall operations contribute and impact the socio-economic transformation of DRC Ituri Province?

iii) What were the challenges encountered by ASGM cooperatives in contributing to the social and economic development in DRC Ituri Province?

iv) What could be the opportunity and possible alternatives to better drive and enhance ASGM cooperative activities in order to boost the socio-economic progress in DRC Ituri Province?

1.6 Significance of the Study

The primary user of this research could be the DRC Ministry of mining through its state regulatory body SAEMAPE as an institution in charge of ensuring compliance with the legislations governing ASM sector. From the report, SAEMAPE office could grasp and evaluate the social and economic performance of ASGM cooperatives activities in Ituri Province, learn some lesson and build up some corrective measures for the weaknesses based on recommendations.

The second users could paramount different stake holders who were interested in the ASGM cooperatives such the country chamber of mine, other government agencies and business communities. Furthermore, this study was of invaluable importance for any researcher who desired to conduct a study in this or related fields.

Finally, the proposed study fulfilled the partial requirement for the award of MBA (Master of Business Administration) at Uganda Christian University.

1.7 Scope and limitations of the study

1.7.1 Subject Scope

In this study, the researcher attempted to assess holistically the social and economic impact of ASGM cooperatives accomplishments in a particular area of DRC thus Ituri province where artisanal gold mining was widespread. In order to make the study wieldy convenient to evaluate the problem in detail, the present research was confined to the examination of

the social and economic of the registered ASGM cooperatives with a particular emphasis on the Revised Mining Code 2018 (Law n°18/001) of March 09th 2018 requirements Article 114 bis bound for to ASM.

Moreover, the researcher presumed that those ASGM cooperatives had a practical knowledge about how their undertakings were impacting the community and the country' economy at large.

1.7.2 Geographical Scope

Research investigations were limited to ASGM cooperatives registered and legally recognized with the Ministry of mine and mineral resources through its body SAEMAPE with the current gold mining operations in Ituri Province only around the Kilo, Nzani, Mambasa, Ngaya and Panga belts (cfr 5.1 Appendices i. Gold Map of Ituri Province covering ASM sites).

1.7.3 Time Scope

Due to time's constraints, the researcher completed this work within 5 weeks from the field data collection up to data processing, analysis, interpretation and final presentation.

1.8 Conceptual Framework

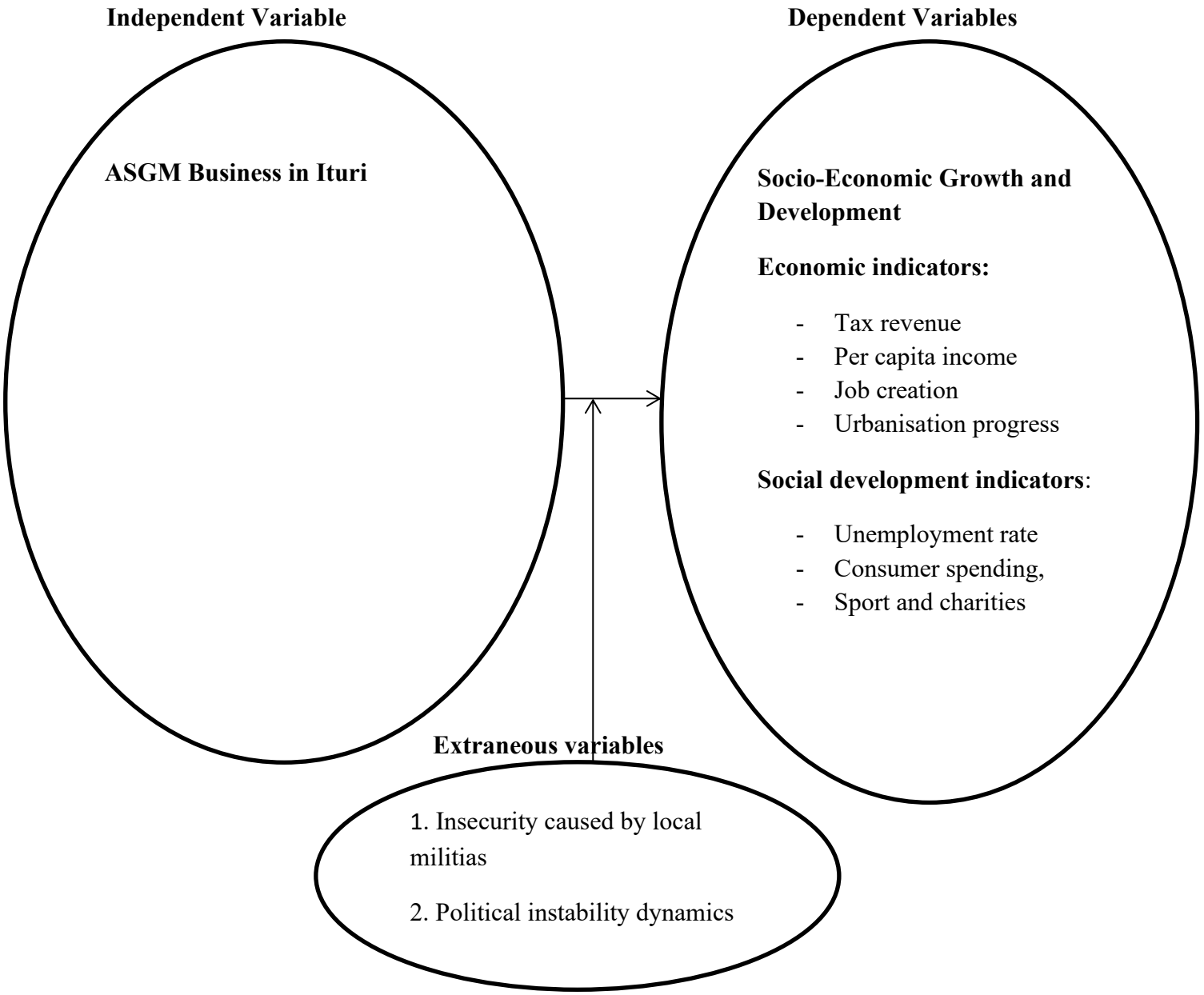


Figure 1: Conceptual framework adopted from Koontz and Weihrich (1988). **Comments:** This diagram demonstrated how the ASGM cooperatives gold mining activities had an impact first on the social indicators such as unemployment rate, consumer spending and secondly on economic indicators like annual income (GDP), investment & trade, Housing (Home sale & building) as drivers to the economic growth and social development in the region. Additionally, some the intervening factors such as insecurity by

local militias were taken into considerations as extraneous variables affecting the socioeconomic impacts in the study area Ituri Province.

1.9 Organisation of the Study

In due process, the final report of this planned study was rationally structured in the following ways. The research paper was divided into six chapters. The chapter one presented the introduction part focusing on the background information and statement of the problem. It also fixed the research questions and objectives, significance of the study, scope and limitation of the study, conceptual framework, significance, scope and limitations including the full-length organization of the research paper. Then, chapter two depicted in a broader perspective the literature review on the subject matter with a particular attention on the set objectives. Besides, chapter three focused on the methodology of the study, chapter four on research presentation, analysis and interpretation. Subsequently, chapter five presented finding results and conclusion. Finally, the recommendations were compacted on chapter six to seal the report.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

The ASM sector has for a long time attracted the attention of academicians, researchers, the international community and policymakers. Over the years, literature and work reports concerning this subject have accrued. While many studies have been conducted, a few have had concern with Sub-Saharan Africa.

Grounded on the Scientific Knowledge theory, this chapter presented an in-depth review of different previous works published by researchers in relation to a specific phenomenon termed the social and economic impact of the artisanal and small scale mining. As modern theory, the scientific knowledge theory is known as a comprehensive type of literature review based on the accumulated findings from prior research in a research domain, where individual studies constitute building blocks (Rowley & Paul 2021).

Although great emphasis was put on the socio-impact generated by the artisanal mining activities, let's note that the information generated were of great importance with regards towards the general characteristics, opportunity and magnitude of ASM sector worldwide. As suggested by Paul & Al to accomplish this, others defined their research objectives based on gaps in the relevant literature, and design a study to address this gap (Paul et Al 2021).

Consequently, the current chapter depicted this literature based on four objectives major themes portraying after key concepts meaning in relation to the study, first the nature and the institutional framework of ASM, secondly the socio-economic impact of ASM operations followed by the drawbacks and challenges encountered while concluding with the opportunity to enhance ASM activity to show the gap in knowledge of the phenomenon studied.

2.2 Key Concept Definitions

2.2.1 Artisanal Mining and Small Scale Mining

Generally, artisanal and small-scale mining are characterized by low levels of capital expenditure and technology usage and high levels of labor intensity (Weldegiorgis et al., 2021 & Weng and Margules, 2022). In order to conflate the terms 'artisanal' and 'small-scale' mining both conceptually and on the ground, let's note that:

- ✓ According to Sidorenko et al. (2020), artisanal mining can be defined as manual and/or poorly mechanised;
- ✓ While small-scale mining uses normally more advanced technological means the manual artisanal undertakings.

As a result, child labour and a large number of fatal accidents have been reported in artisanal mines (especially coal mines, gold mines, stone mines). To improve the situation of small-scale miners, organizing them in cooperatives and certifying gold may be helpful. Globally, artisanal mining contributes 17% to 20%, or between 380 and 450 tonnes of annual gold production. This gold input is equally a significant contribution to both the international gold industry and the economy for a given community.

2.2.2 Economic impact analysis

An economic impact analysis (EIA) attempts to measure or estimate the change in economic activity in a specified region, caused by a specific business, organization, policy, program, project, activity, or other economic event.

- ✓ It usually measures changes in business revenue, business profits, personal wages, and/or jobs.
- ✓ An economic impact analysis is commonly conducted when there is public concern about the potential impacts of a proposed project or policy like the chosen subject about the socio-economic impact of artisanal mining

The Economic Impact Analysis (EIA), as a methodology for evaluating the impacts of a project, program or policy on the economy of a specified region, is an important analysis tool for decision-making, providing a measure of strategic goal achievement that complements the analysis of efficiency analysis and financial feasibility.

2.2.3 Social impact analysis

Social impact analysis is a method that uses data analysis techniques and tools to measure the impact of a particular initiative, program, or policy on a specific outcome or set of outcomes such as health outcomes, educational outcomes, employment outcomes, or other social well-being measures.

The goal of impact analytics is to understand the extent to which a particular intervention has had a positive or negative impact on the desired outcome and to identify ways to improve the effectiveness of the intervention. By analyzing this data, it can be determined if the intervention has decreased disease rates, improved access to healthcare, and better health outcomes for the community future intervention to inform resource allocation decisions, and provide evidence of the initiative's impact on stakeholders and policymakers.

The analysis typically involves identifying key metrics or indicators that measure the desired outcomes of the intervention and then analyzing the data to determine the extent to which those outcomes have been achieved.

2.3 The nature and the institutional framework of artisanal and small scale mining (ASM)

2.3.1 Characteristics of artisanal and small Scale Mining (ASM)

Given the context-specific variation of definitions of ASM, the authors use the terms artisanal and small-scale mining to refer mainly to the informal and unauthorized mining branch comprising those local miners operating outside the purview of state regulation. This is irrespective of the physical characteristics of the mine or the level of sophistication employed by miners.

According to Chaparro (2020), using the legal rubric governing mining activities in different countries, it is possible to group together the criteria used and stratify the mining industry. In particular, ASM activities may be categorized. This does not exclude the simultaneous use of more than one criterion. There are countries that have programs for small mining, despite the fact that this activity goes unrecognized by the mining law of the

country. There are also countries with special laws that apply different treatment to small mining, as in the case of Brazil with its 'Garimpo' or 'Garimpogen' law. The following criteria are most often used (Chaparro, 2020):

- Production volume
- Number of people per productive unit
- Intensity (volume) of capital employed
- Labour productivity
- Size of mine claim
- Quantity of reserves
- Sales volume
- Operational continuity
- Operational reliability
- Duration of the mining cycle

Following Chaparro (2020) report, each of these criteria has its advantages and difficulties depending on the country, the type of mining, the minerals produced, political conditions and the number of miners in each country. While many attempts have been made to define ASM, a common definition of the term has still not been found. Previous definitions made use of the limited investment volume of the operations, the small workforce or the limited mineral production. The local definitions vary from country to country according to the macroeconomic situation, the geological framework, the mining history and the legal conditions. Nevertheless, ASM is characterized by a number of conditions:

- Lack of or limited use of mechanization, and a lot of physically demanding work
- Low level of occupational safety and health care
- Poor qualification of personnel at all levels of the operation
- Inefficiency in exploitation and processing of mineral production (low recovery value)
- Exploitation of marginal and/or very small deposits, which are not economically exploitable by mechanized mining
- Low level of productivity
- Low level of salaries and income

- Periodic operation by local peasants by season or according to the market price development
- Lack of social security
- Insufficient consideration of environmental issues
- Chronic lack of working and investment capital

According to ECLAC on the basis of various official publications, experts have come out with some of the characteristic which can globally pin out some specific elements such as:

- ✓ Intense use of manual power
- ✓ Low level of technological development
- ✓ Supply to the local markets
- ✓ Wide range of products
- ✓ Environmental damages
- ✓ An employment option in a poor areas
- ✓ Precarious safety and health conditions
- ✓ Social and legal conflicts
- ✓ Low production costs
- ✓ Many stakeholders involved
- ✓ Variable volume and size according to the mineral and the regions
- ✓ Stimulate local economies
- ✓ Takes place worldwide
- ✓ Generates local production chains
- ✓ Encourages geopolitical developments
- ✓ Encourages larger projects
- ✓ Explore new deposits
- ✓ Widespread of geographical distribution

2.3.2 Artisanal and small scale mining (ASM) policy and institutional framework

In WGC report 2019, the WGC, working closely with its members, and following an extensive consultation period, launched the Responsible Gold Mining Principles (RGMPs), a framework that clearly sets out what constitutes responsible gold mining. The RGMPs

cover 51 Principles that speak to all material environmental, social and governance issues for the gold mining sector. Implementation status has to be publicly reported and conformance is subject to assurance by independent experts.

Conformance with the RGMPs is obligatory for WGC members and a number of other gold mining companies have also decided to implement the RGMPs to demonstrate to their stakeholders that they are mining responsibly. The RGMPs, and other responsible mining codes, reflect a deep commitment from the mining industry to operate responsibly.

Gold mining only takes place with the formal approval of the host government. In most places, before a mine can be constructed, the company must conduct a detailed Environment and Social Impact Assessment (ESIA) which is then reviewed by regulators and subject to government approval.

In Ghana, the regulation of ASM activities can largely be described as unsuccessful up to date. Though the exact figures vary across sources because most evidence show that more than 85% of small-scale mining operations still occur in the informal and illegal sector of the economy and outside the purview of state regulation (Abdulai, 2017; Boafo et al., 2019). Studies generally highlight the limited efficacies of formalization efforts in reducing illegal mining either because licensing blueprints are too complex and expensive, or lack of proper coordination and communication between relevant agencies and institutions (Adu-Baffour et al., 2021).

Faced with the proliferation of these artisanal mines, governments have sometimes tried to ban artisanal mining, but more generally adopt various strategies to control or regulate this sector of activity, which can take different forms. When the strategy is to regulate the activity through formalization, gold miners are expected to access mining permits, which in practice are often hindered by important financial and social barriers and administrative obstacles (Hilson 2020). However, this activity is mobile by nature, depending on new discoveries, as well as frequent expulsions from the mining sites. Some gold mining sites have been exploited for one or two centuries and are tolerated, and yet most remain in the realm of informality.

The deployment of this activity in space and time, Surveys in Geophysics 1 3 and its regulation, is therefore a complex issue involving many actors: the state and its representatives at various levels, the local authorities (e.g., heads of districts, mayors), the customary authorities (administrative heads of villages), investors from the political–economic elite, the landowners, as well as the villagers and immigrants from neighboring areas and countries.

The regulation of ASGM is accompanied by missions on the ground by the authorities, involving controls, the seizure or destruction of equipment, and so-called clearing operations of illegal sites. Conflicts with artisanal gold miners also occur in the case of attribution of exploration or exploitation permits to large/international mining companies. This regulatory effort is also accompanied by training of artisanal gold miners (e.g., training camps in Côte d'Ivoire) aimed at developing environmentally more friendly practices and the development of an activity within a legal framework. However, these efforts are strongly undermined by the costs and difficulties to monitor activities, which usually take place at large distance of major urban centers or capitals.

Ghana has implemented a district-centered model for ASM formalization, where district centers play a central role in the formalization strategy, while Zimbabwe is considering decentralizing licensing processes to improve the efficiency of issuing licenses for ASM activities.

Ghana has widely adopted the Certification Mining Scheme (CMS) to enhance governance in the ASM sector, while Zimbabwe has taken measures to decentralize mining control and support local ASM populations as part of efforts to shift towards more decentralized formalization policies.

Zimbabwe has recognized the need to promote access to land for ASM by identifying and demarcating land and zones specifically for ASM activities, while Ghana has not explicitly mentioned this as part of its formalization strategy.

Overall, both countries have recognized the importance of decentralization in ASM formalization to improve governance, increase transparency, and empower local communities involved in artisanal and small-scale mining activities. However, the specific

approaches taken by each country differ based on their unique contexts and priorities. A clear strategy for engagement is critical.

2.4 The socioeconomic contributions of artisanal small scale mining (ASM)

2.4.1 ASM contributions to GDP

According to World Bank (2020), a total of US$37.9bn was added to the GDP of the 38 host countries from gold mining. For every dollar of gold production, at least 63 cents end up as salaries, taxes or income for local business owners in host countries. Gold mining companies also support the economic transformation of countries through local procurement and skills transfer, including helping improve resource governance. Increasingly, gold mining companies are acting as partners in development, helping turn mineral wealth into a means of advancing human development. Gold mines bring opportunities and act as an engine of economic growth, especially in poorer, more remote locations where there are often few alternative avenues for economy activity and community advancement.

From World Bank (2020), Mining has played a pivotal role in driving economic growth in Ghana. The sector's contribution to the country's gross domestic product (GDP) has been significant, primarily through foreign exchange earnings, investments, and its linkages with other sectors of the economy. Furthermore, the mining sector has catalyzed economic diversification and industrialization in Ghana. The industry's presence has stimulated the growth of associated sectors, such as manufacturing, construction, and transportation. This interdependence between mining and other sectors has created employment opportunities and contributed to overall economic expansion. Foreign exchange earnings from mining exports have also bolstered Ghana's economic growth. The inflow of foreign currency enhances the country's international trade position, strengthens its balance of payments, and provides resources for the importation of goods and services that support various economic activities (World Bank, 2020).

As this report shows, in 2020 WGC (World Gold Council with 33 members gold mining companies such as Barrick gold, AngloGold Ashanti, China gold, B2gold, Rand Gold member companies spent US$437.8mn on community investment, which is on average

more than $14mn per company. This is in addition to the US$7.6bn paid in taxes that can be used by governments, for example to improve public services, education, healthcare and infrastructure. Gold mining companies increasingly work side-by-side with local and regional governments when prioritizing, planning and implementing socio-economic development initiatives, and these partnerships will drive further progress.

A case demonstrated that Rwanda has been the region's top economic performer the last decade. Its macro-economic performance during this period has been consistently impressive with a gross national income (GNI) of USD 700 per capita in 2015.

The country considers mining through its Artisanal and small scale mining to be one of the important sectors in terms of its contribution to increased employment, exports, and foreign direct investment (FDI). Extending from eastern DRC across Rwanda and into southwest and northern Burundi, the 3T belt of east and central Africa produced 51% of the world's tantalum supply (28% of which is produced in Rwanda), 3% of the world's tin, and 2% of its tungsten in 2013-18 . These products are largely exported in the form of mineral concentrates of cassiterite (tin), tantalite (tantalum), and wolframite (tungsten). In addition to the 3T minerals, Rwanda also produces niobium, some gold and gemstones, and a range of construction minerals serving mainly in-country markets (e.g., limestone used in cement production, clay bricks, stone aggregate)..

The specific targets for the mining sector were very ambitious for 2017/2018. They resulted in:

- ✓ Contribution of mining to GDP growing from 1.2% to 5.27%;
- ✓ The mining work-force growing from 20,000 to 60,000 members ;
- ✓ Total investment (cumulative) in the sector growing from USD 150 million to USD 500 million;
- ✓ Export earnings growing from USD 158 million to USD 400 million;
- ✓ Certified mine sites with efficient water and waste management systems growing from 20% to 100%;
- ✓ Certified mine sites with safe and secure working conditions growing from 25% to 80%.

While in Ghana, there is considerable evidence that ASM has the potential to contribute to poverty alleviation. In 2018, ASM accounted for 43% of Ghana's total gold production (Adu-Baffour et al., 2021). Despite these significant contributions, the full potential of ASM in Ghana has not yet been realized as a large portion of the sector's activities remains in the informal economy.

2.4.2 ASM contributions towards tax revenue

Gold mining companies make significant contributions to host country government revenues. In many low income developing countries, these taxes and royalties constitute a notable proportion of the national tax base, enabling both mining and non-mining areas to benefit from a country's mineral endowment. Major gold mining companies have been at the forefront of the implementation of the Extractive Industries Transparency Initiative (EITI), a global standard for the mining and energy industries that promotes revenue transparency and accountability.

In 2020, WGC member companies paid US$7.6bn in taxes to their host governments in the form of corporate, employment and other taxes, and royalties. These payments are governed by the fiscal regimes and operating agreements that companies must adhere to in order to access a mineral deposit. Furthermore, WGC member companies follow strict regulatory standards in relation to anti-corruption practices, codes of conduct and financial disclosures. Encouragingly, many gold mining jurisdictions are showing signs of better governance, which is vital to ensure that tax revenues benefit the country's citizens.

Live case in Ghana where taxes imposed on mining companies include corporate income tax, withholding tax, and value-added tax (VAT) proved to be more productive than any other sector. These taxes generate substantial revenue for the government, contributing to its overall budgetary resources. Royalties, which are typically based on a percentage of the value of minerals extracted, provide additional income to the government (Ghana Extractive Industries Transparency Initiative, 2021). The revenue generated from mining activities has been instrumental in financing infrastructure development projects across the country. Investments in road networks, energy systems, water supply, and 11 telecommunications infrastructure have been funded, in part, by mining revenues. These

infrastructure developments not only support mining operations but also benefit the broader population by improving connectivity, promoting economic activities, and enhancing overall living standards (World Bank, 2020).

2.4.3 ASM & Employments

According to a recent survey carried out by the International Labour Organization (ILO Geneva) and MMSD (Mining, Minerals Sustainable Development), at present around 13 million people work directly in small mines throughout the world, most of them in developing countries. A large percentage of these miners are women and, regretfully, children.

Artisanal and small-scale mining (ASM) has been recognized for providing diverse opportunities for employment and income for different groups of people, especially in a context where ASM continues to grow. Responsible gold miners recognize the mutual benefits of integrating as much as possible into the local economy, using local people and supply chains. This both supports their 'license-to-operate' and enables the community to benefit from the economic and social development of the mine. Statistics show that 44.75 million persons across 80 countries seek employment opportunities in the ASM sector (Perks & McQuilken, 2020).

Many people across the globe, including women, young men, children, low-skilled individuals, migrants, school dropouts, students, and even former government employees, seek employment opportunities in the sector (Arthur-Holmes et al., 2022a).In addition, gold mining companies create local jobs, both directly and indirectly. Our data shows that in 2020, the 31 WGC member companies included in the survey directly employed close to 200,000 people. 95% of the people who work at our member companies' mine sites are nationals of the country where they work, with the remaining 5% being expatriates.

In addition, gold mining catalyzes many more indirect jobs in the wider economy. Our members supported 1.2 million jobs through their local suppliers. In contrast to these dynamics which speak more to informal ASM operations, the formal aspect of ASM provides job security and decent working conditions for many people (Botchwey et al., 2022, Ofosu and Sarpong, 2022; Martinez et al., 2021). An emerging body of research

literature has underscored the growing involvement of (educated) youth seeking employment in formal and informal ASM spaces (Arthur-Holmes et al., 2022a, Osei and Yeboah, 2023).

Many young graduates are often motivated to build entrepreneurial activities in ASM or seek employment in the sector simply because of the limited employment opportunities in the formal sector after school. Others are inspired by the desire to diversify their income sources or move into ASM as a more lucrative livelihood activity that provides significant income (Arthur-Holmes et al., 2022a, Hilson and, Osei et al., 2022, Osei et al., 2021). The growing involvement of young university graduates or educated youth provides avenues for the potential transfer of knowledge from educational settings to ASM operations, which can contribute to responsible and safer mining practices. However, the peculiarities of educated youth engagement in ASM and how their engagement contributes to the sector's transformation and sustainability through the introduction and propagation of knowledge about responsible mining practices, safer and cleaner production, and environmentally friendly technologies are poorly understood.

2.4.4 ASM benefits to community welfare and growth (Livelihood, infrastructure, health, education…)

In this regard, ASM has become a regular and significant source of livelihood for many people, especially those in rural communities (Arthur-Holmes and Abrefa Busia, 2021, Huntington and Marple-Cantrell, 2022, Osei and Yeboah, 2023).

ASM provides a vital livelihood for nearly 45 million people around the world, with tens of millions more people also dependent on the sector, including family members and small business owners along the ASM supply chain. Artisanal mining is an important driver of development in communities from Africa to Asia, where there are often few other opportunities available for generating income.

We know that ASM contributes positively on the road to many of the Sustainable Development Goals, and with inclusive, comprehensive formalization, the global community can mitigate ASM's negative impacts. Historically, mining operations have not always led to improvements in human and social development, as mining standards and

expectations evolve; governments and mining companies are much more likely to insist on the application of stringent environmental, governance and social protocols as a condition of operating. Those that don't follow high standards of operational and ESG practices are unlikely to be successful in the long run. Companies are acutely aware that operating responsibly is synonymous with good business. The expectations are that the benefits of gold mining are shared equitably among the different stakeholder groups particularly, as we show in this report, those in country, including local employees and suppliers, communities and governments.

From World Bank 2019 report, 44.75 million people working across more than 80 countries make their living directly in ASM. While most of the world's large-scale miners enjoy relative security, artisanal and small-scale miners work almost exclusively in difficult and dangerous conditions, and their contributions to the supply minerals into global supply chains for everyday use remain hidden. Indeed, artisanal and small-scale miners are vital in providing raw minerals for modern day communications, low carbon and clean energy technologies (World Bank 2020), and luxury jewelry goods. Illustrative examples include gold and gemstones found in women's jewelry; tin and tantalum for laptops, smartphones, and electronic devices; cobalt used in the batteries of electric vehicles; phosphates for fertilizers vital to agriculture; and stone aggregate for road construction and housing. When combining ASM's direct labor figure with its indirect one at least a further 134 million and perhaps as many as 269 million people depending on the multiplier used are supported in service and downstream industries (World Bank 2019a, 71).

According to World Bank 2019, ASM operates in over 80 countries and is the dominant livelihood in some. In the Central African Republic two thirds of people are estimated to rely directly or indirectly on artisanal diamond mining and conservative estimates suggest it injects as much as $144.7 million into the economy. In Bolivia, mining makes up approximately 40 per cent of current income from exports, 32 per cent of which comes from ASM, with 85 per cent of the mining sector's total employment in small mining cooperatives and mines. In Mongolia, local economies near mining are worth an estimated $505 million annually (World Bank 2019a, 71).

2.4.5 ASM contributions to Housing Sector

The viability of ASM and its importance in enabling a significant number of individuals to earn income to acquire a variety of assets (e.g. residential plots, housing and buildings, transport service) and to pursue imaginary future projects have been amply described (Arthur-Holmes and Abrefa Busia, 2022a, Arthur-Holmes et al., 2022a, Osei et al., 2021, Hilson and Hu, 2022).

According to EITI (2021) in Ghana, mining revenue has been allocated to social programs aimed at improving education, healthcare, and social welfare. Investments in these sectors help address social disparities and promote inclusive development. For example, revenue from mining has been used to build schools, hospitals, and other healthcare facilities, and to provide scholarships and social assistance programs to support vulnerable populations (Ghana Extractive Industries Transparency Initiative, 2021).The revenue generated from mining activities has been instrumental in supporting infrastructure development and investment in social services, which are vital for economic progress and societal wellbeing. These investments have helped improve transportation networks, build schools and healthcare facilities, and enhance public utilities, among other.

2.5 Artisanal and small scale mining (ASM) Challenge and Opportunity

Inadequate legal frameworks and poor enforcement further compound the challenges faced by ASM miners. Insufficient regulations or weak enforcement make compliance difficult, leaving miners uncertain about how to operate legally. Corruption poses a severe problem in many countries where ASM is prevalent. Miners may be subjected to demands for bribes or extortion, making it difficult for them to comply with regulations. Access to support services such as training, equipment, and technical assistance is often lacking for ASM miners. This absence of necessary resources makes it challenging for them to comply with regulations that emphasize safe and environmentally friendly mining practices.

Following Owusu et al. (2019), one of the primary reasons ASM miners fail to adhere to mining laws is a lack of awareness. Many miners are unaware of the specific laws and regulations that govern their activities. This lack of knowledge is often attributed to limited education and information dissemination.

Amidst calls for ASM formalization, some scholars have stressed that effective regulation of the ASM sector can also address the widespread illegality in informal ASM spaces while allowing individuals operating in the sector to have productive employment, decent work and sustainable livelihoods (Owusu et al., 2019, Yakovleva et al., 2022).

The sector's structural challenges include: weak laws, policies and implementation and government marginalisation or repression; cultural marginalisation and exclusion of certain demographic groups; uncontrolled migration; low barriers to entry into informal or illegal ASM with its poor social and environmental protections; poverty driven, short-term decision making; poor access to financial services, market information, technology, and geological data; political exclusion and 'policy blindness'; and a serious lack of data on ASM individuals and communities that reveal the true scale, nature and contribution of the sector.

Research on the impacts of mining in Africa has long focused on the physical aspects of mining (i.e., the presence/abundance and or location of minerals), the environmental effects of mining (i.e., effects on air, water, soil, biodiversity, protected areas and increasingly health effects (Brisbois et al., 2019). The general level of ESIAs is now extremely demanding, usually incorporating a wide set of considerations including water, tailings management, biodiversity and Indigenous rights. This is in stark contrast to artisanal and small-scale gold mining which, although providing livelihood for millions, is often informal (or illegally) conducted and very poorly regulated. As a result, ASM is often, unfortunately, associated with social conflict, poor safety standards, human and labour rights violations, child labour, environmental degradation, and exploitation by organized crime.

In particular, the transfer of knowledge, deployment of environmentally friendly technologies and innovation in the sector can minimize, if not wholly address, the unsafe practices and hazards associated with ASM operations. In harmony with this perspective, ASM is touted as an important avenue to address youth unemployment and to also give opportunities for African youth to infuse fresh and innovative ideas, skills and practices that can transform the ASM sector (Arthur-Holmes, F., Abrefa Busia, K., Vazquez-Brust,

D. A., & Yakovleva, N. (2022). To address these challenges effectively, there is a need for comprehensive reforms that prioritize responsible ASM practices included raising awareness among miners about the relevant laws and regulations, facilitating access to finance, improving data availability, strengthening legal frameworks, combating corruption, and providing adequate support services.

By addressing these issues, Zimbabwe tried to enhance the legal and responsible practices of ASM. This will not only ensure compliance with regulations but also promote sustainable development, protect the environment, and safeguard the rights and well-being of ASM miners and their communities.

In Ghana, Gallwey et al. (2020) applied deep learning to gold panning site detection. The model was also used to quantify the extent of deforestation related to illegal mining in the protected forests of Ghana and to estimate the effect of governance. However, this study also shows the efectiveness of the Ghanaian government's efforts to regulate gold mining in 2017 with a decrease of 6000 ha of impacted land. The deep learning approach also quantified the extent of illegal mining-related deforestation within Ghana's protected forests, measured at over 3500 ha, and with 2400 of these lost since 2015.

In Niger, Abass Saley et al. (2021) were able to map the evolution of the mining site of Koma Bangou during four decades using Landsat data. This study relied on spectral indices designed to be sensitive to minerals present in mining waste (such as oxides and hydrated minerals) and took Surveys in Geophysics advantage of the scarcity of the vegetation in this region by clearly distinguishing the expansion of mining waste, as well as the introduction and expansion of cyanidation (hydrometallurgical technique for extracting gold by converting the metal to a water-soluble coordination complex using an aqueous solution of cyanide) during the last decade.

In summary, responsible ASM businesses should be devoted to high environmental and social principles both because it is the right thing to do, but also critically, because it is well recognized that it helps reduce their risks, strengthens the support of host governments and local communities, and strengthens a company's long-term operational and financial

performance. This will limit ASM several problems and pave ways to future opportunities to many ASM mineworkers.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This section presented an overview of the research instrument designed to answer the research questions set from the objectives of this study. As Jansen and Warren (2020) stated 'Research methodology simply refers to the practical "how" of any given piece of research and more specifically, it is about a researcher systematically designs a study to ensure valid and reliable results that address the research aims and objectives'.

Hence, this chapter aimed at giving details on how the research was piloted. It also set a comprehensive structure for conducting field work on the socioeconomic impact of ASGM cooperatives in DRC Ituri Province.

Therefore, it focused on the study design, study area, targeted population, sample design, sampling size, validity and reliability of instruments, data collection methods, data processing, analysis & interpretation, ethical considerations, presentation, and the limitation of study.

3.2 Research Design

3.2.1 Introduction

Designing a study has help the researcher to plan and implement the study in a way that helps the researcher to obtain the intended results, thus increasing the chances of obtaining information that could be associat*e*d with the real situation (Burns & Grove, 2001). According to research experts, descriptive survey also enables to obtain the current information (Paul, J., Lim, W. M., O'Cass, A., Hao, A. W., & Bresciani, S (2021).

In this study context, the researcher adopted the descriptive correlation design to describe, investigate and show clearly relationships including cause effect relationship between the research independent variables (ASGM cooperatives activities such as gold mining, selling and community involvement) and dependent variable (Social and economic impact on the

unemployment, the housing, consumer spending, trade & investment) including other intervening factors like insecurity perpetrated by locals militias in Ituri Province/DRC.

In fine, the study embraced both qualitative and quantitative methods of investigation techniques such as case study design and descriptive analysis.

3.2.2 Case Study Design

The study used a case of DRC Ituri Province to represent other provinces since it was identified as region of having high number of ASGM cooperatives activities. The time under investigation was from 2014 to date, a period during which the Revised Mining Code 2018 (Law n°18/001) of March 09th 2018 was enacted. This case study was selected to enable an analysis of the impact of ASGM cooperatives activities into DRC economy and development in general and suggest solutions to some of the challenges facing the sector. A case study therefore was found far more comprehensive and thus suitable for the study as quoted by Bloomberg & Volpe (2022): A case study is one of the most widely used and accepted means of qualitative research methods in the social sciences.

3.2.3 Descriptive Design

Preliminary, the researcher conducted a descriptive survey which involved assembling primary information by interviewing a sample of 30 gold miners and 5 key informants both members of 15 active and registered ASGM cooperatives in the region. Remarkably, they were all able to give their own points of view and data that became very consistent and fundamental for the study. Their contributions facilitated flexibility to attain a deeper understanding of ASGM cooperative world. These evidences further helped out in formulating accurate recommendations as listed in chapter six.

3.3 Study Area

The research investigations bounded mining sites disseminated into five gold belts named Kilo, Mambasa, Ngaya, Nzani and Panga in DRC Ituri Province. The 5 gold belts are disseminated in the five territories of Ituri province: Kilo (Djugu and Irumu), Nzani (Mahagi and Aru) and the last territory of Mambasa hemmed in three gold belts (Mambasa, Ngaya and Panga). Factual details are in Appendix I (Gold Map covering ASGM sites).

3.4 Population of the Study

According to Madame FURAHA CHUMA BIJOUX, Director of SAEMAPE-Ituri, among multiple ASGM cooperatives claiming to operate in her jurisdiction, there were 15 legally registered ASGM cooperatives currently active in over 445 Mining sites with a population of 198 active members in the five gold belts in DRC Ituri Province. The following was the overall list of the 15 active ASGM Cooperatives whose activities and realizations are recorded with SAEMAPE-ITURI as of July 2024.

Table 1. List of 15 Active ASGM Cooperative Population in Ituri Province

N°	SIGLE	FULL NAME	REGISTRATION / FILE	STATUS	ACT. MEMBER
01	COOPEMI	Coopérative des Exploitants Miniers Artisanaux de l'Ituri	N°0336/CAB.MIN/ MINES/01/2016 du 05 Aout 2016	ACTIVE	20
02	COMIMAV	Coopérative Minière MOZINDO ADA VALERE	Arrêté Ministériel N°0328/CAB/MIN/01/2016 du 05 Aout 2016	ACTIVE	12
03	COMOI	Coopérative Minière des Orpailleurs de l'lturi "COMOI"	Arrêté Ministériel N°330/CAB.MIN/MINES/01/2016 du 05 Aout 2016	ACTIVE	21
04	COOMICO	Coopérative Minière pour le Développement du Congo	Arrêté Ministériel N°0321/CAB.MIN/MINES/01/2016 du 05 Aout 2016	ACTIVE	14
05	"CO-MIDI/pas à pas"	Coopérative Minière pour le Développement intégral "CO-MIDI/pas à pas"	Agréée	ACTIVE	10
06	COOMINDEF	Coopérative Minière	Arrêté Ministériel	ACTIVE	11

		NDELE et Frères "COOMINDEF"	N°063/CABMIN/MINES /01/2017 du 14 Octobre 2016		
07	COOMISARA	Coopérative Minière Saint Raphael "COOMlSARA"	Arrêté Ministériel N°0632/CABMIN/MlNES/01/2017 du 14 Octobre 2017	ACTIVE	10
08	COPERAME/CA	Coopérative Minière de MUNGBWALU et ses Environs avec conseil d'Administration "COPERAME/CA"	Arrêté Ministériel N°0754/CAB.MIN/MINES/01/2016 du 24 octobre 2016	ACTIVE	08
09	COOMITURI	Coopérative Minière de l'Ituri "COOMITURI"	Arrêté Ministériel Ministériel N°0332/CABMIN/MINES/01/2016 du 05 Août 2016	ACTIVE	09
10	NDO-OKEBO "SOCOMIN-DOK	Société Coopérative Minière de NDO-OKEBO "SOCOMIN-DOK"	Arrêté Ministériel N°0092/CABMIN/MINES/01/2016 du 29 Avril 2016	ACTIVE	13
11	COOP-UMOJA	Coopérative Minière "UMOJA'' de l'Ituri	Agréée	ACTIVE	08
12	COONORI	Coopérative des Négociants d'Or de l'Ituri "COONORI"	Arrêté Ministériel N°0102/CAB.MIN/MINES/01/2016 du 04 mai 2016	ACTIVE	30
13	COODEMI	97 Coopérative de Développement Minier de l'Ituri "COODEMI"	Arrêté Ministériel N°0320/CAB.MIN/MINES/01/2016 du 05 Aout	ACTIVE	11

			2016		
14	COOEMACO	Coopérative Minière des Exploitants des Matériaux de Construction "COOEMACO"	Arrêté Ministériel N°0331/CAB.MIN/MINES/01/2016 du 05 mai 2016	ACTIVE	22
15	COOMEA	Coopérative Minière des exploitants artisanaux "COOMEA"	Arrêté Ministériel N°0281/CAB MIN/MINES/01/2017 du 28 Août 2017	ACTIVE	08
TOTAL				**15**	**198**

Source : SAEMAPE Archive 2024

3.5 Sampling Method and Sampling Size

3.5.1 Sampling Method

As non-probability sampling method was employed to select first ASGM cooperatives members from their offices and the SAEMAPE employees from the Ituri province directorate office in Bunia. The researcher used judgmental (purposive) sampling to select ASGM cooperatives members and SAEMAPE employees from whom the researcher intended to get relevant and accurate information. This step was so important to confront information gathered from the primary source with the ministry of mine through SAEMAPE data archive (Secondary data) by competent officials in charge of compliance with the legislations governing the artisanal and small-scale mining Cooperatives in Ituri province.

3.5.2 Sample Size

The researcher determined the sample size using Sloven's statistical formula (YAMANE, T.1967), which states that, for any given population, the required sample size is given by;

$$n = \frac{N}{1 + N(e^2)}$$

Where n=the required sample size; N= the known population size; and e= level of significance, which is= 0.05

ASGM active cooperative members, estimated target = 198

$$N = \frac{198}{1+150(0.05^2)} = \mathbf{144}$$

Table 2: Number of ASGM CooperativevRespondents

	Respondents	**Target Population size**	**Margin error**	**Confidence level**	**Required sample size**
	15 active ASGM cooperative's members	198	5%	95%	144
	Total	**198**	**100%**		**144**

Therefore, given a total population of **198** respondents (From 15 active ASGM cooperatives) for study in Ituri Province of the Democratic Republic of Congo (DRC), total sample was **144** respondents as indicated in table 1 above. Basically, the study concentrated on a total of 144 respondents who were ASGM cooperatives members and some key informants representing the government's body SAEMAPE and CEO of some registered ASGM cooperatives actives in different mining sites.

3.6 Data Collection Methods

3.6.1 Data Type

The researcher employed both primary and secondary sources of data in an effort to gather relevant information.

3.6.2 Source of Data

In order to meet the study objectives, primary data collection were obtained using questionnaire, interviews, observation and photography. These channels greatly smoothed to get first-hand information about ASGM cooperative business in Ituri Province.

Meanwhile, the secondary data were collected from consulting various SAEMAPE and ASGM cooperatives archives and other references from dissertations reports, media (News

Papers and Magazines) and books with relevant literature, policy statements and legislation about the ASM sector in general and ASGM in particular. The gained information were synthesized to complete the study by highlighting key factors emerging from the findings which were applied to the current study problem**.**

3.7 Data Collection Methods and Procedures

3.7.1 Questionnaires

As leading tools, questionnaires were dispersed among some selected ASGM cooperatives members. They were organised in a coherent order to address the research four specific objectives with an open view to allow the respondents express themselves without fear and restrictions in order to eliminate bias due to large number of respondents (144).

Most importantly, the above method facilitated to detect information that could not be willingly provided face to face such as income earning, living standard and property acquisition of ASGM cooperatives members. Moreover, the questionnaires were translated mostly in French as official language and two national languages Kiswahili plus Lingala in order to avoid misinterpretations of the questionnaire thus provide respondents with more accuracy in their responses.

3.7.2 Interviews

The interview scheme was used specifically with some key informants representing the government's body SAEMAPE and CEO of some registered ASGM cooperatives that were active in different mining sites. Some qualitative and quantitative data obtained from the key interviewers were so crucial for the study.

3.7.3 Observation

Busetto et al. (2020) illustrated that "observing how people behave and interact with each other and the world provides insights into actual behaviours as opposed to what people say they do". Following the above remark and the nature of the present study focusing on socio-economic impact of ASGM cooperatives undertakings, the use of observation method turned out to be an important tool to get some informations that were not revealed by respondents such as environmental effects of the mining in the region, the extravagant

life of gold miners and their wrapped assets. In summary, it was observed that ASGM cooperative contributed a lot to DRC economic growth and development despite some of the downsides of their gold mining operations.

3.7.4 Photography

In order to ensure proficiency in data collection, analysis and presentation, the researcher took some pictures around some ASGM cooperatives mining sites and workshops to give a photographic representation of the current gold mining operations in Ituri province. Following today life realism where you need to see something before you can accept that it really exists or occurs, the researcher took some pictures of ASGM cooperatives members on site tasks. Site photography schemes clearly revealed the true and actual understanding of ASGM operations in DRC Ituri province.

3.8 Sampling Instruments

Several research instruments were used to conduct the study including interview guides, questionnaires, pens, camera, and tally sheet. For questionnaire, since a variety of responses were expected from our respondents, Likert's scales were used with format of an emblematic five level query on some questions (1**) Strongly disagree, 2) Disagree, 3) Neutral, 4) Agree and 5) Strongly agree with a score analysis of ≥ 3= Agree and < 3=Disagree**) in addition to interviews guided and specific questions. According to Bhandari (2020), these response anchors could definitely measure spectrums like frequency and satisfaction for capturing the level of respondents' feelings regarding the topic in a more nuanced way [Bhandari, P. & Nikolopoulou, K. (2023, June 22)].

3.9 Method of Data Presentation and Analysis

3.9.1 Data presentation

Quantitative data were presented using tables, figures, chart, and percentage to match them with the study objectives. However, the qualitative aspects were scrutinized using qualitative expression and applied inductive reasoning to get a clear understanding due to explanatory aspects of the study. After assigning each item with a numerical representation

for completion of coding process, all data were move into statistical package for social scientists (SPSS) and Microsoft excel.

3.9.2 Data analysis

For inferential analysis, Pearson correlation was employed to measure the relation between ASGM cooperatives gold mining business (IV) and the economic growth and development in Ituri Province (DV). Meanwhile, Anova linear regression analysis was used to test the significance of the relationship between the above IV and DV variables. Descriptive statistics were used to analyse and determine data frequency and percentage distributions.

3.10 Validity and Reliability of Instruments

In order to test the reliability and validity of the data collection instrument, pre-test of the instruments on ASGM cooperative's members and SAEMAPE officials were done to determine the relevance of questions included in the instrument and the methods used. This phase revealed the suitability of the methods and instruments that were employed in the study because the selected respondents better were quite familiar with the subject especially the impact of their activities on social development and the country economic growth. Consequently, this led to an early detection of possible errors or distortions which were later sorted out.

Therefore, the Content Validity Index (CVI) was calculated for the questionnaires using Kathuri and Pals (1993) as follows:

$CVI = \frac{The\ number\ of\ relevant\ questions}{The\ total\ number\ of\ questions}$ CV= 7/9=0.78

The above formula showed that for nine total set questions, seven were relevant by the mean of 0.78 near 0.83.

Therefore, 0.78 was considered as an accepted value according to the formula which stated that any CVI should be above 0.76 in order to be highly reliable.

3.11 Ethical Considerations

For the study to be carried out efficiently and effectively, the researcher sought special permission from Madame FURAHA CHUMA Bijoux, Director of SAEMAPE/Ituri as a matter of procedure in government institutions in regards to the requirements for

international study investigation in the country. After ARN (National Intelligence Agency) vetting, the permission was granted consequently it paved way to proceed to the 15 active ASGM cooperatives offices and gold mining sites for field data collection.

For the purpose of ensuring utmost confidentiality for both respondents and data brought, the following principle codes were applied as requirements for research report:

- ✓ All questionnaires were coded to provide anonymity.
- ✓ Authors mentioned were recognized through citations and referencing
- ✓ All photography's pictures were taken on approvals and consents.

3.11 Restrictions encountered throughout the study

Several limitations were encountered during the field work such as security threats, high long distance and high living cost around gold mining sites. The researcher was forced to always present the SAEMAPE access stump to different mining sites and ASGM cooperatives offices. Sometimes, the researcher had to wait 2 to 3 days for on the road the multiple rebels and the inaccessibility of the roads. The long distance between different gold bets and mining sites such as from Nzani belt to Kilo belt (± 230 km), Kilo belt to Mambasa belt (± 260 km) and Mambasa to Panga belt (± 300 km).

Some of the 144 respondents were so reluctant to reveal some personal information until begged and convinced sometimes at a cost. Given the above limitations coupled with the busy schedules for both key informants and ASGM cooperatives members, the research took slightly long to conclude the study from initially timetable.

CHAPTER FOUR
RESEARCH PRESENTATION, ANALYSIS AND INTERPRETATIONS

4.1 Introduction

This chapter presented the study findings compiled regarding the study's field data collection on the socio-economic impact ASGM Cooperatives in RDC Ituri Province. The episode contained data collected via questionnaire, interviews, observations, photography and focus group discussions. Based on the research questions, the presentation was allocated into the following subdivisions: the nature and scope of ASGM cooperatives proceeded by the demographic attributes, the assessment of the impact of ASGM cooperatives' activities in terms of social development, economic contributions, and gold mining drawbacks to finally conclude with a number of challenges encountered by ASGM cooperatives in Ituri Province.

4.2 Overview of the nature and scope of ASGM Cooperatives in Ituri Province

4.2.1 Introduction

By the virtue of the New DRC Mining Code 2018, artisanal gold miners should be organized their activities under **mining cooperative** denominations. They should be legally registered with Ministry of Mines under SAEMAPE's supervision as custody of ensuring compliance with the legislations governing ASM in the country. From the field data, 58 fully registered ASGM Cooperatives were identified throughout the Ituri gold mining sites (91 others with the registration process undergoing).

Therefore, the present findings were mainly taken from miners who had membership in registered cooperatives (58) according to the provisions of the laws governing the ASM sector despite the presence of miners without cooperative membership operating around different sites in Ituri Province.

4.2.2 Artisanal Gold Extraction Methods used by ASGM Cooperatives

In the five gold belts disseminated in Ituri province, the findings results showed two types of gold extraction namely Alluvial and Amalgam Gold. For the ASGM cooperatives using rudimentary artisanal methods, alluvial gold is extracted from the rivers, creeks or

alongside the river banks. Research showed that alluvial gold could have purity ranged between 90-95%. However, the amalgam gold is extracted from the stone aggregates or rocks in the mountain holes mostly in underground mine technique known locally as “sous courant”. Its gold concentration could be estimated between 72-90%

The gold extraction techniques are quite parallel:

- For the Alluvial Gold: After Searching and detecting gold sites, miners go on to excavating the river and hollow it out to get gold sands. Then, they are conveyed out to a workshop where they proceed to the process of washing and filtering of the gold from the sands starts to obtain the precious metal to be taken finally to the Gold purchasing counter (Gold buyer and seller).
- For the Amalgam Gold: After Searching and detecting gold sites, miners proceed to digging the underground holes to obtain gold stones or creeks then ferrying them out from the wells. The transporters carry them to a workshop where some local made crushers called “concasseur JANG-FA” crush them into powder. So, they proceed to the process of washing and cleaning of the gold powder, then going to leaching and filtering of the gold from the powder to obtain the precious metal to be taken to the Gold purchasing counter (Gold buyer and seller).

4.2.3 Organization of the gold mining sites

The organization of various gold mining sit is quite complex. The owner of the site known as camp is called the PDG (Président Directeur Général) or AFM (Administrateur du Foyer Minier) meaning the Chief Executive Officer (CEO) of the mining site. He can delegate his authority sometimes to a supervisor as Managing Director responsible for daily management, for all the works on the site. The supervisor could organize a special brigade head by a commander of the Disciplinary Brigade to be in charge of security on the site for both mining and commercial activities. One site could have more than one hole and headed by the heads of holes. The heads of holes are responsible for a team of miners called “Boulonneurs” whose number varies from 10 and 50 workers. Often, heads of holes are responsible for all the daily needs of the miners: food, health needs, equipment including unforeseen events such as land slide accident.

The MD could also nominate some technical directors for overseeing the various holes, controllers for supervising the production of each hole, a advisors for counseling in case of difficulties between the artisanal gold miners, an head of business community to supervise others commercial traders on the site, assistant to responsible for the welfare of mothers in the mining site, and controller responsible for the rights of minors...

4.2.4 The number of ASM gold miners and sites in Ituri Province

Finding from the first and largest gold belt called Kilo belt showed that the number of artisanal gold miners in Djugu territory amounting to a total is 45,685 spread in 78 various ASGM sites. Its neighboring territory Irumu situated in the same belt contained a total of 22,350 artisanal gold miners in 11 different ASGM sites. The territory of Mambasa had the largest number because it covered three gold belts named Mambasa, Panga and Ngaya belts with an estimated total of 87,660 artisanal gold miners dispersed into 237 different ASGM sites. The Nzani belt counted in Mahagi territory a total of 10,950 artisanal gold miners disseminated into 14 diverse ASGM sites and 1,500 artisanal gold miners in Aru territory situated in the same belt with 6 ASM sites.

In total, the results identified approximately 168,145 artisanal gold miners actively working into 445 various ASGM sites across the five gold belts disseminated in Ituri province. Most importantly, the present statistic was a result of the field data but its update could be factor to adjustment due to components such as insecurity in the region making some sites inaccessible and the recurrent gold miners' relocation in search of new mining sites compelling them to move from one gold belt to another.

Table 3. Statistic of ASGM Population in 5 Gold Belts

(Research field estimation Ituri-August 2024)

N°	Gold Belt Name	Adm.Territory	Gold Mining Site Number	Number of ASM Gold Miners (July-August 2024 estimation)	Productive sites
01	Kilo Belt	Djugu	78	45,685	Pamba,
					camp Blanquette
					Lodjo
					mabanga
		Irumu	11	22,350	Bavi
					Balazana
02	Mambasa belt	Mambasa	237	87,660	Russie
					Yolo
					Mushasha
					Brazaville
03	Ngaya Belt				Mopa
					Canon
					Pk 23
	Panga Belt				Camp base
					Mabele Mokonzi
04	Nzani Belt	Mahagi	14	10,950	Kolwezi
					Matadi
		Aru	06	1,500	kandoy
TOT	**5**		**445**	**168,145**	

Source: Research Primary data

4.3 Demographic Attributes of the Respondents

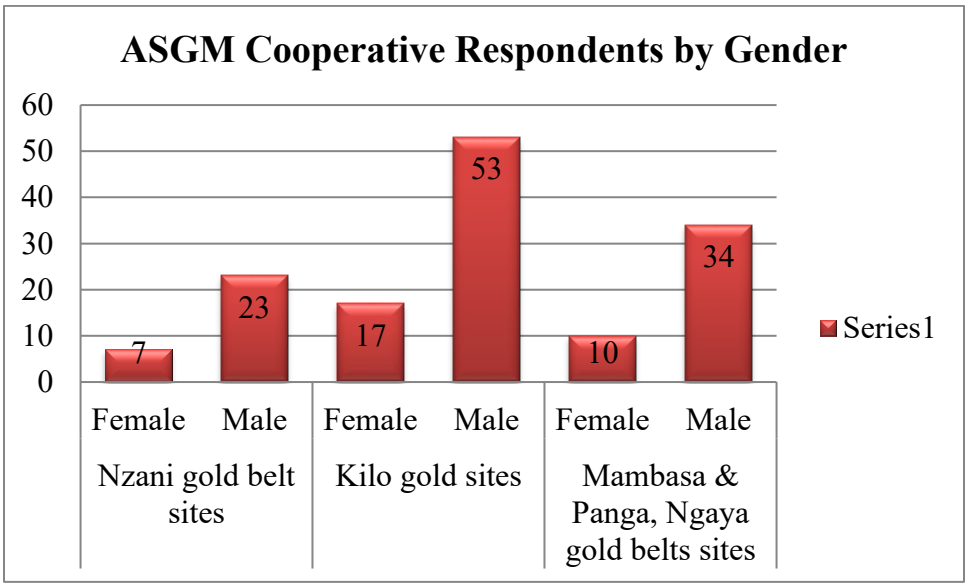
This segment presented some findings variables in reference to nature of the ASGM sector by pointing out the gender, age and the length of experience of the respondents.

4.3.1 Gender Profile &Identity

ASGM Cooperatives respondents that were interviewed in different sites situated in the four gold belts named Nzani, Kilo, Mambasa, Panga and Ngaya was one hundred forty four (144) picked from 15 active ASGM cooperative in the region among the multiple ASGM registered cooperatives supervised by SAEMAPE office in Ituri Province (Appendix v).

These cooperatives are abiding by the Article 114 bis of the Revised Mining Code 2018 in the Democratic Republic of Congo related to ASM cooperatives or mineral resource management. The research results showed that 24% of respondents were female (34) while 76% represented the male gender (110). More details are shaped in table 4.

Table 4: ASGM Respondents by Gender

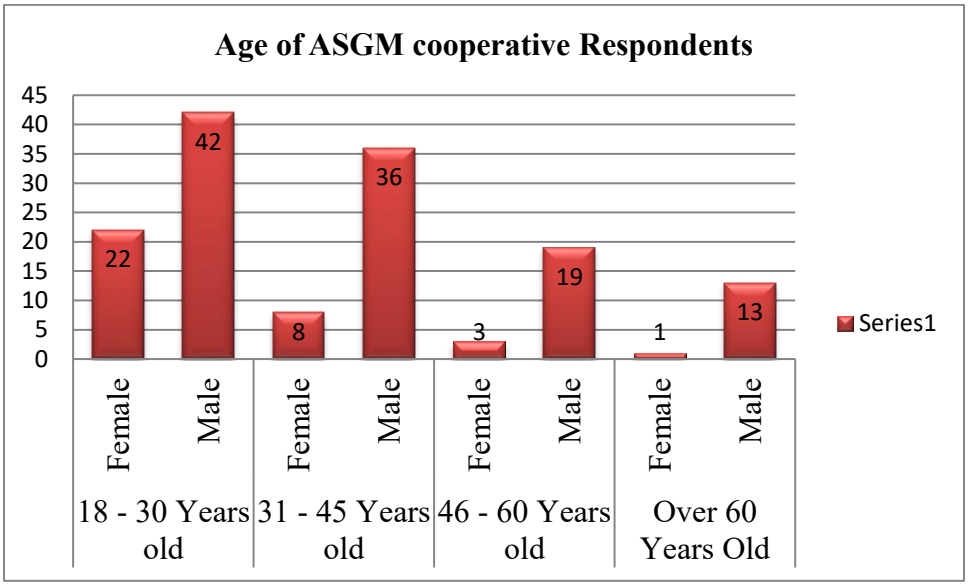


Source: Research Primary data

4.3.2 Age Group Profile

From the field data, 44% were aged between 18 - 30 years old (64). Accordingly, the percentage of respondents between the ages of 31 - 45 years was 31% (44), while that of 46 - 60 years was 15.3(22). Lastly, the one of 61 years and onward was 10% (14) as indicated in Table 5 below.

Table 5: Age of ASGM Cooperative Respondents

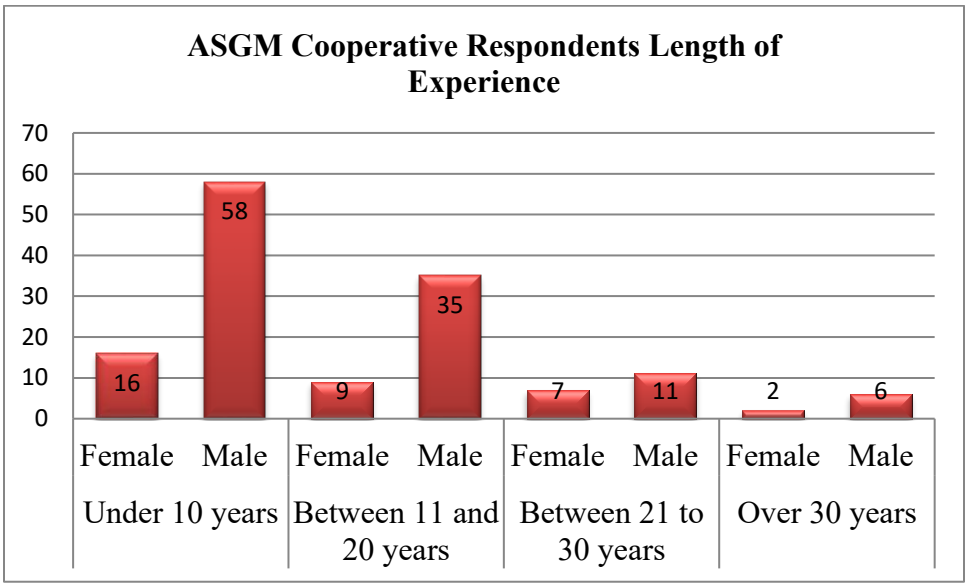


Source: Research Primary data

4.3.3 Length of Experience in the Sector

The research data indicated that ASGM cooperative members with a length of experience below 10 years represented 51%, from 11 to 20 years counted for 31%, 21 to 30 years tallied 13% and the last group of over 30 years embodied 5% as tabled down.

Table 6: Length of experience for ASGM respondents

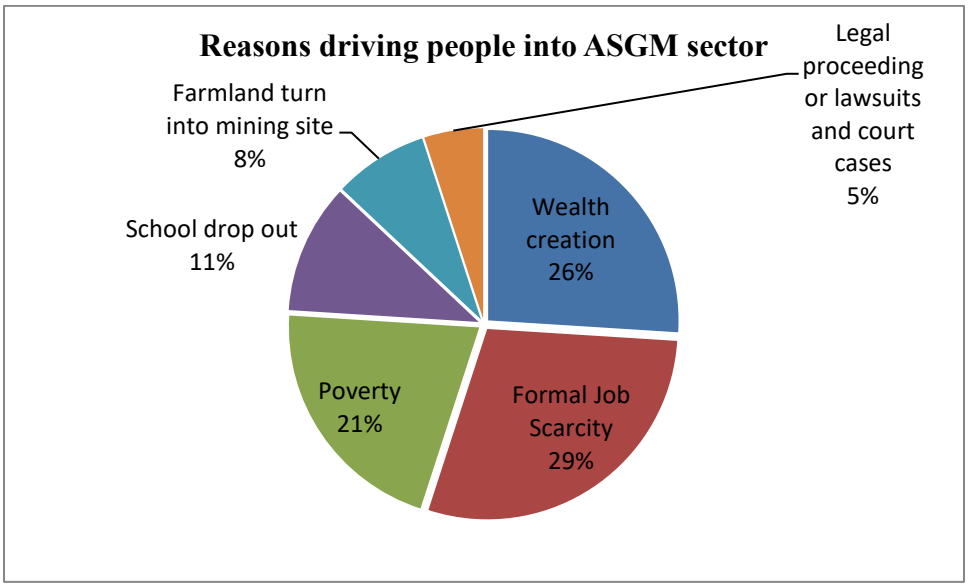


Source: Research Primary data

4.4 Reasons for joining of ASGM Sector

From the fields, here are some of the main reasons driving new gold miners into ASGM sector. The process of top-down listening used the background knowledge and the significance of the described reason among ASGM respondents to create meaning.

Figure 2. Reasons Driving Gold miners into ASGM Cooperative



Source: Research Primary data

4.4.1 Formal Job Scarcity: The lack of formalized job in Ituri Province was quoted in the second position with a portion of 29%.

4.4.2 Wealth creation: From the fields' data, the need to create wealth took almost 26% of the interviewers' responses main reasons driving new gold miners into ASGM cooperatives.

4.4.3 Poverty: according to 21% of group interrogated, poverty was among the leading reasons which had forced some of them into gold mining activities via ASGM cooperatives.

4.4.4 School dropout: Having left school, some of 11% of ASGM cooperatives interviewed asserted that no any other opportunity was available to them apart from going into gold mining sites.

4.4.5 Farmland turn into mining site: An explanation that the region has been turn into mining site was so far quoted at slice of 8% as reason to abandon firming sector.

4.4.6 Lawsuits and other factor: For a cluster of 5% ASGM cooperative respondents, the lawsuits have driven them into gold mining activities under ASGM cooperative.

4.5 ASM Economic Development Contributions

Analyzing the findings from the indicator:

4.5.1 Living standard (Consumer spending with minimum 3$ daily expense)

In order to examine the living standard of ASGM cooperative members (Consumer spending $\geq$ 3 $ daily), two tests thus Pearson simple correlation and ANOVA linear regression analysis were done and the results are presented as followed:

a) Correlation between ASGM cooperatives affording a living standard of 3 $ versus the economic growth and development

Pearson simple correlation test was used to check the relationship between ASGM cooperatives affording a living standard of 3 $ as result of gold mining activities and the impact on the country economic growth and development.

Table 7. Pearson simple correlation matrix on ASGM cooperatives living standard versus the economic growth and development

		Economic Growth and Development	Living standard with daily spending ≥ 3$
Economic Growth and Development	Pearson Correlation Sig. (2-tailed) N	1 144	0.918** 0.000 144
Living standard with daily spending ≥3$	Pearson Correlation Sig. (2-tailed) N	0.918** 0.000 144	1 144
**Correlation is significant at the 0.01 level (2-tailed).			

Source: IBM SPSS Statistics Data Editor

As displayed in table 7 above, the result shows that Pearson's correlation coefficient r is 0.918, very strong correlation with p = 0.000 which expresses with very much confidence that ASGM cooperative member affording a 3$ living standard from their gold mining activities impact the economic growth and development with a high significant connection. This finding suggested that the earnings of most ASGM cooperatives enabled them to afford a living standard beyond 3$ daily rate which has a very high positive effect on the country growth and development. This confirmed the hypothesis that there is a very strong correlation between ASGM cooperatives gold productivity and their living standard that resulted in economic growth development in Ituri province.

b) Regression on living standard of ASGM cooperatives activities impacting the economic growth and development

To establish the extent at which ASGM cooperatives living standard of influences the economic growth and development, a simple linear regression analysis was piloted using

the ANOVA regression analysis techniques of adjusted R2, f-constant values and t-value at 0.01 significance levels. The results are presented in the table below.

Table 8. ANOVA simple regression model summary on ASGM cooperatives living standard versus the economic growth and development

Model	R	R2	Adjusted R2	t-value	f-constant	b coefficient	Sig	Std. Error of the Estimate
1	0.918[a]	0.843	0.841	27,437	759,811	0.871	0.000[b]	0.496
	P<0.01 a. Dependent Variable: Economic Growth and Development b. Predictors: (Constant), ASGM Cooperative Living standard with daily spending ≥ 3$							

Source: IBM SPSS Statistics Data Editor

The regression model in table 12 above showed the adjusted R2 value of 0.841which expressed a very high level of correlation measuring the variance in the DP variable titled "Economic Growth and Development" that is explained by the ID tilted ASGM cooperatives members affording 3$ daily rate of living standard from the gold mining activities with a strong percentage of 84.3%. Whereas the adjusted R2 = 0.841 (Very good 84.1%) shows whether adding an additional predictor could improve a regression model or vice-versa. Then, the t-value of 27,437 reflected a high statistically significant regression. The f-coefficient value of 759,811 overruled absolutely the null hypothesis. Still, the beta coefficient of 0.871 > 0.5 stated for every unit in ID represented by ASGM cooperatives Living standard, the outcome variable titled the country economic growth and development will increase by the aforementioned beta value of 0.841. The standard error estimate of 0.496 looks good and adequate. In fine, the regression analysis used to assess these two variables sanctions the statement that there is a very strong and high level of significance in the liaison between ASGM Cooperative ASGM Cooperatives Living standard with daily spending ≥ 3$ versus the economic growth and development in the Province of Ituri/DRC.

4.5.2 Annual Income of the ASGM respondents (Broad estimation about 10,000$)

To gauge ASGM cooperative income level, Pearson simple correlation and ANOVA regression analysis were employed to measure its impact on the economic growth and development:

a) Correlation between ASGM cooperatives annual income level of 10,000 $ estimation and the country economic growth

Pearson simple correlation test was employed to test the relationship between ASGM cooperatives annual income of 10,000 $ earned from gold mining activities and the impact on the country economic growth and development. The result is in table 11 above

Table 9. Pearson simple correlation matrix on ASGM cooperatives annual income versus the economic growth and development

		Economic Growth and Development	ASGM Cooperative Annual earnings up to 10,000$
Economic Growth and Development	Pearson Correlation	1	0.619*
	Sig. (2-tailed)		0.000
	N	144	144

ASGM Cooperative Annual earnings up to 10,000$	Pearson Correlation Sig. (2-tailed) N	0.619* 0.000 144	1 144
*Correlation is significant at the 0.01 level (2-tailed).			

Source: IBM SPSS Statistics Data Editor

As shown in Table 11 above, Pearson's correlation coefficient r = 0.619** showed moderately strong correlation with p = 0.000 expressing statistically significant relationship. Thus, the correlation between a number of ASGM cooperative respondents earning approximtivily 10,000 $ from their gold mining activities and the economic growth and development is stated at r = 0.619 which is moderate strong relation subsequently with positive effect on economic growth and development. This confirmed the hypothesis that there is a moderate positive correlation between ASGM cooperatives earnings from gold productivity and the effect on the economic growth in the Democratic Republic of Congo.

b) Regression between ASGM cooperatives income level derived from gold mining activities and the economic growth and development

To establish the extent at which the income earned by ASGM cooperatives activities influencing the economic growth and development, a simple regression analysis was piloted using the ANOVA regression analysis techniques of adjusted R2, f-constant values, f-coefficient, b-coefficient and t-value at 0.01 significance levels. The results are presented in the table below.

Table 10. ANOVA Simple Regression Model Summary on ASGM cooperatives annual income versus the economic growth and development

Model	R	R2	Adjusted R2	t-value	f-constant	b coefficient	Sig	Std. Error of the Estimate
1	0.619[a]	0.379	0.370	6,069	42,954	0.477	0.000[b]	0.988
	P<0.01							

	a. Dependent Variable: Economic Growth and Development b. Predictors: (Constant), ASGM Cooperative Annual Earnings up to 10,000$

Source: IBM SPSS Statistics Data Editor

The above regression model indicated the adjusted R2 value of 0.379 signifying a moderate influence on the two variables. The adjusted R2 projected the country economic growth and development at 37% of the variance in the ASGM cooperatives members' income annually. The t-value of 10,437 is considered to be statistically significant because it is greater than 2. Our f= 42,954 > 2.5 confirms our objective of rejecting the null hypothesis and it shows the amount by which ASGM cooperatives respondent 10,000$ income derived from gold activities as predictor variable, the country economic growth and development as dependent variable would increase by beta coefficient of 0.477 confirming its contributions towards the growth and improvement in the region. The standard error estimate of 0.988 is around 1 that is acceptable and positive. The Anova regression study therefore established the hypothesis that there is a moderate significance in the relationship between ASGM cooperatives income earning from gold mining activities and the country economic growth and development in Ituri Province.

4.5.3 Job Creation and Employment by ASGM Cooperatives

In order to estimate the rate of employment through the job created by ASGM cooperative, Pearson simple correlation and ANOVA regression analysis were respectively used to assess its influence on the economic growth and development:

a) Correlation between ASGM cooperatives job creation and employment patterns versus the economic growth and development

Pearson simple correlation test was employed to experiment the relationship between ASGM cooperatives job creation and employment incentives in gold mining sector as well as the influence on the country economic growth and development. The result is in table 11 below.

Table 11. Pearson simple correlation matrix on ASGM cooperatives job creation and employment patterns versus the economic growth and development

		Economic Growth and Development	ASGM cooperatives job creation and employment incentives
Economic Growth and Development	Pearson Correlation Sig. (2-tailed) N	1 144	0.601* 0.000 144
ASGM cooperatives job creation and employment incentives	Pearson Correlation Sig. (2-tailed) N	0.601* 0.000 144	1 144
*Correlation is significant at the 0.01 level (2-tailed).			

Source: IBM SPSS Statistics Data Editor

As shown in Table 11 above, Pearson's correlation coefficient r = 0.601** showed moderate positive correlation with p = 0.000 stating that is its relationship is statistically significant. It means that both ASGM cooperatives members employed in the sector and other employees benefiting from their side jobs created have a moderate and positive correlation on the economic growth and development. This confirmed the hypothesis that there is a moderate positive correlation between the two variable both the predictor and the dependent at r = 0.601.

b) Regression between ASGM cooperatives job creation and employment incentives from gold mining profit and its impact on the economic growth and development

To establish the level at which ASGM cooperatives job creation and employment incentives in gold mining sector impact on the country economic growth and development. Anova technique was conducted using simple regression analysis method of adjusted R2, f-constant values, f-coefficient, b-coefficient and t-value at 0.01 significance levels. The results are presented in the table below.

Table 12. ANOVA Simple Regression Model Summary on ASGM cooperatives job creation and employment patterns versus the economic growth and development

Model	R	R2	Adjusted R2	t-value	f-constant	b coefficient	Sig	Std. Error of the Estimate
1	0.601[a]	0.361	0.357	8,963	108,928	0.585	0.000[b]	0.998
	P<0.01 a. Dependent Variable: Economic Growth and Development b. Predictors: (Constant), ASGM cooperatives job creation and employment incentives							

Source: IBM SPSS Statistics Data Editor

The directly above simple regression analysis pinned out the adjusted R2 value of 0.357. Even though < 0.4, it demonstrated a moderate correlation because the study was contextualised in social sciences objectives. The adjusted R2 itself predicted the country economic growth and development at 35.7% of the variance in ASGM cooperatives job creation and employment initiatives. However, the t-value of 8,437 is considered to be statistically significant because it is greater than 2. Our f= 8,963 > 2.5 approves the set objective of eliminating the null hypothesis and it shows the extent by which ASGM cooperatives job creation and employment incentives as predictor variable increases when the country economic growth and development as dependent variable increase its standard by a beta coefficient of 0.585. The standard error estimate of 0.998 is around 1 thus more acceptable. The above Anova simple regression analysis therefore honoured the hypothesis that there is a moderate significance in the connection between ASGM cooperatives job creation and employment incentives derived from gold mining activities and the economic growth and development in Ituri Province of the Democratic Republic of Congo.

4.5.4 Tax Payment by ASGM Cooperatives (Fiscal obligation)

To weigh up the tax payments made by ASGM cooperatives and the contributions towards the economic growth and development in the region, Pearson simple correlation and ANOVA regression analysis were employed separately in order to attain the set objective:

a) Correlation between ASGM cooperatives tax payments and the economic growth and development

Pearson simple correlation was done to test the liaison the tax payment made by ASGM cooperatives throughout their gold mining activities and how it impacts the country economic growth and development. The result is in table 11 below.

Table 13. Pearson simple correlation matrix on ASGM cooperatives tax payments and the economic growth and development

		Economic Growth and Development	ASGM cooperatives Tax Payments
Economic Growth and Development	Pearson Correlation Sig. (2-tailed) N	1 144	0.801* 0.000 144
ASGM cooperatives Tax Payments	Pearson Correlation Sig. (2-tailed) N	0.801 0.000 144	1 144
*Correlation is significant at the 0.01 level (2-tailed).			

Source: IBM SPSS Statistics Data Editor

As shown in Table 11 above, Pearson's correlation coefficient r = 0.801** showed a very strong correlation with p = 0.000 stating that is its relationship is highly statistically significant. This shows that ASGM cooperatives tax payments derivative of gold mining activities in the region have a very strong and positive correlation on the economic growth and development. If ASGM cooperatives tax payment variable increases, it leads

automatically to the increase of economic growth variable as outcome. Thus, it long-established the hypothesis that there is a very strong correlation between the two variables both the predictor and the dependent at r = 0.801.

b) Regression between ASGM cooperatives tax payments versus the economic growth and development

Anova technique was conducted using simple regression analysis method of adjusted R2, f-constant values, f-coefficient, b-coefficient and t-value at 0.01 significance levels to institute the regression level. The results are offered in the table below.

Table 14. ANOVA Simple Regression Model Summary on ASGM cooperatives tax payments versus the economic growth and development

Model	R	R2	Adjusted R2	t-value	f-constant	Beta coefficient	Sig	Std. Error of the Estimate
1	0.801[a]	0.642	0.639	15,943	254,176	0.660	0.000[b]	0.748
	P<0.01 a. Dependent Variable: Economic Growth and Development b. Predictors: (Constant), ASGM cooperatives Tax Payments							

Source: IBM SPSS Statistics Data Editor

The directly above simple regression analysis pinned out the R-squared value of 0.639 which is much closed to finance verge of 0.7. This R-squared is considered relatively strong and it showed a high level of correlation. The adjusted R2 of 0.639 forecasted exclusively the economic growth and development at 63.9% of the variance from ASGM cooperatives tax payments contributions. On the other hand, the t-value of 15,943 reflected a high statistically significant regression. The regression f-value of 254,176 rejected totally the null hypothesis. While the regression beta coefficient of 0.660 > 0.5 indicated that ASGM cooperatives tax payments from their business predict the country economic growth and development at the above beta value. The standard error estimate of 0.748 is scaling 1

but still positive. Therefore, Anova simple regression analysis used to test these two variables confirms the assumption that there is a very strong positive significance in the relationship between ASGM cooperatives tax payments resulting from gold mining activities and the economic growth and development in the Province of Ituri/DRC.

4.5.5 Trade, Investment and Housing sector shaped ASGM Cooperatives

Pearson simple correlation and ANOVA regression analysis were engaged distinctly into evaluating the Housing sector, trade and investment made through ASGM cooperatives gold mining revenues and its contributions towards the economic growth and development:

a) Correlation between Trade and Investment and Housing shaped ASGM Cooperatives versus the country economic growth and development

After testing the two variables, Pearson simple correlation result is presented in table 11 below:

Table 15. Pearson simple correlation matrix on ASGM cooperatives housing, trade and investment versus the country economic growth and development

		Economic Growth and Development	Housing sector, Trade and Investment shaped ASGM Cooperatives
Economic Growth and Development	Pearson Correlation	1	0.552*
	Sig. (2-tailed)		0.000
	N	144	144
Housing sector, Trade and Investment shaped ASGM Cooperatives	Pearson Correlation	0.552	1
	Sig. (2-tailed)	0.000	
	N	144	144
*Correlation is significant at the 0.01 level (2-tailed).			

Source: IBM SPSS Statistics Data Editor

As revealed in the above Table, Pearson's correlation coefficient r = 0.552** and p = 0.000 showed a fair positive correlation between ASGM cooperative trade and investment made from gold mining profits and the economic growth and development in the region at fair r-coefficient of 0.552. This outcome advocated that the investment and trade initiatives made by ASGM cooperatives affected reasonably the country economic growth and development with unbiased positive significance. This evidence showed that there is a fair positive correlation between the above two variables.

b) Regression on ASGM cooperative housing sector, trade and investment and the economic growth and development

in order to test the regression level between the ASGM cooperative housing sector, trade and investment patterns made from gold mining profits and the economic growth and development, Anova technique was conducted using simple regression analysis method of adjusted R2, f-constant values, f-coefficient, b-coefficient and t-value at 0.01 significance level. The results are filled in the table below.

Table 16. ANOVA Simple Regression Model Summary on ASGM cooperative housing, trade and investment and the economic growth and development

Model	R	R2	Adjusted R2	t-value	f-constant	Beta coefficient	Sig	Std. Error of the Estimate
1	0.552[a]	0.304	0.299	7,879	62,085	0.519	0.000[b]	1,042
	P<0.01 a. Dependent Variable: Economic Growth and Development b. Predictors: (Constant), Housing sector, Trade and Investment shaped ASGM Cooperatives							

Source: IBM SPSS Statistics Data Editor

Anova simple regression analysis trapped in the adjusted R2 value of 0.304 which proved a moderate influence. The adjusted R2 itself hardly predicted the economic growth and development by 30.4% of the variance in Housing sector, Trade and Investment shaped

ASGM Cooperatives. However, the t-value of 7,879 > 2 remained statistically significant. The f= 62,085 > 2.5 highly excludes the null hypothesis. While the beta coefficient of 0.519 predicts the increase in every unit in the predictor variable named housing sector, trade and investment shaped ASGM Cooperatives by an increase of dependent variable by a beta coefficient value of 0.519. The standard error of 1,042 greater than 1 become a positive value. in conclusion, the projected Anova simple regression examination therefore confirmed the postulate that there is a fair and moderate significance in the relationship between ASGM cooperative housing expansion, trade and investment shapes made from gold mining returns and the economic growth and development in the case of Ituri Province in the Democratic Republic of Congo.

4.6 ASGM Social Development Contributions

4.6.1 Family Care and Support (From ASGM cooperatives gold activities profits)

Pearson simple correlation and ANOVA regression analysis were used to assess the financial support ASGM cooperatives provide to cater for their family needs following their hard earnings gold proceeds. Here are the results:

a) Correlation between Family Care & Support by ASGM cooperatives and the economic growth and development

Table 17. Pearson simple correlation matrix on ASGM cooperatives family care & support versus the economic growth and development

		Economic Growth and Development	ASGM cooperatives Family Care and Support
Economic Growth and Development	Pearson Correlation	1	0.825*
	Sig. (2-tailed)		0.000
	N	144	144
ASGM cooperatives Family Care and Support	Pearson Correlation	0.825	1
	Sig. (2-tailed)	0.000	
	N	144	144

*Correlation is significant at the 0.01 level (2-tailed).

Source: IBM SPSS Statistics Data Editor

The above results from Pearson's correlation test showed r coefficient of 0.825** which confirmed a very strong correlation between family care initiatives by ASGM cooperatives and economic growth and development. Following the 2-tailed sig of 0.000, it definitely deemed extremely statistically noteworthy. This shows that ASGM cooperatives privileged their family needs at all cost. And it is a good indicator for social development and the economic growth that proceeds from gold mining activities go towards miners siblings wellbeing. Consequently, it proved the theory that there is a very strong correlation between family care as predictor and the economic growth and development as the dependent at r = 0.825.

b) Regression between Family Care & Support by ASGM cooperatives and the economic growth and development

Anova technique was conducted using simple regression analysis method of adjusted R2, f-constant values, f-coefficient, b-coefficient and t-value at 0.01 significance levels to institute the regression level. The results are offered in the table below.

Table 18. ANOVA Simple Regression Model Summary on ASGM cooperatives family care & support versus the economic growth and development

Model	R	R2	Adjusted R2	t-value	f-constant	Beta coefficient	Sig	Std. Error of the Estimate
1	0.825[a]	0.681	0.680	17,879	302,776	0.843	0.000[b]	0.744
	P<0.01 a. Dependent Variable: Economic Growth and Development b. Predictors: (Constant), ASGM cooperatives Family Care and Support							

Source: IBM SPSS Statistics Data Editor

In the simple regression analysis results, the R-squared value of 0.681 closer to 0.7 showed a strong and high level of correlation. The adjusted R2 of 0.678 predicted fully the

economic growth and development at 67.8% when manoeuvring with ASGM cooperatives family care and support variance. Next, the t-test value of 17,400 revealed a high statistically significant regression. While, the f-coefficient value of 302,776 overruled entirely the null hypothesis. The regression beta coefficient of 0.843 > 0.5 indicated that ASGM cooperatives family care and support from gold business forecast the country economic growth by the beta value for every one unit increase in the predictor named family care and support. The standard error estimate of 0.744 is ascending 1 while still optimistic from the Anova regression analysis. Hence, Anova simple regression analysis used to test these two variables confirms the assumption that there is a very strong high significance in the relationship between ASGM cooperatives family care initiative and the economic growth and development in Ituri province.

4.6.2 Education support initiative (From ASGM cooperatives gold activities profits)

Education support initiative endeavor as one of the main social aims at which most of god miners strive at when struggling to dig gold throughout Ituri province. For better assessment, Pearson simple correlation and ANOVA regression analysis were largely used to test how the profit from ASGM cooperatives activities benefits and support their sibling education:

a) **Correlation between ASGM cooperatives Education support initiatives versus economic growth and social development**

The following is the result from Pearson simple correlation test as presented in table 11 below:

Table 19. Pearson simple correlation matrix on education support initiatives versus economic growth and social development

		Economic Growth and Development	Education support by ASGM Cooperatives
Economic Growth and Development	Pearson Correlation Sig. (2-tailed) N	1 144	0.659* 0.000 144
Education support by ASGM Cooperatives	Pearson Correlation Sig. (2-tailed) N	0.659 0.000 144	1 144
*Correlation is significant at the 0.01 level (2-tailed).			

Source: IBM SPSS Statistics Data Editor

As revealed in the above Table, Pearson's correlation coefficient r = 0.659** and p = 0.000 showed a fair positive correlation between ASGM cooperatives education support initiatives versus economic growth and social development at moderately strong r-coefficient of 0.659. This result fortified the fact that ASGM cooperatives put education support as priority despite the multiple challenges in the sector. Thus, it affects positively the social development and the growth in Ituri province. This result marked a moderate positive correlation between ASGM cooperatives education support initiatives versus economic growth and social development.

b) Regression on Education Support Initiative by ASGM Cooperatives and the economic growth and development

The test results of adjusted R2, f-constant values, f-coefficient, b-coefficient and t-value at 0.01 significance levels are tabled below.

Table 20. ANOVA Simple Regression Model Summary on education support initiatives versus economic growth and social development

Model	R	R2	Adjusted R2	t-value	f-constant	Beta coefficient	Sig	Std. Error of the Estimate
1	0.659[a]	0.434	0.430	10,427	108,733	0.580	0.000[b]	0.992
	P<0.01 a. Dependent Variable: Economic Growth and Development b. Predictors: (Constant), Education Support Initiative by ASGM Cooperatives							

Source: IBM SPSS Statistics Data Editor

The R square of 0.434 indicates the moderate variance in DV explained by ID while the adjusted R2 value of 0.430 shows an estimated 43% to measure and capture the level of variance. The t-test value of 10,427 is far greater than the required 2 limit demonstrating that our regression results are statistically very much significant. The f= 108,733 is over 2.5 edge which definitely eliminates the null hypothesis in the study. The standard error estimate of 0.992 is scaled and is greater than 1 shows a strong positive value. While the beta coefficient of 0.580 forecasts the increase in every unit in the predictor variable labelled education support initiative by ASGM Cooperatives by an increase of dependent variable named the economic growth and development by a beta coefficient value of 0.580. In conclusion, the projected Anova simple regression examination therefore confirmed the postulate that there is a moderate significance in the link between the above two variables in the case of Ituri Province in the Democratic Republic of Congo.

4.6.3 ASGM Cooperative self-satisfaction and unemployment rate in the sector

To evaluate ASGM Cooperative self-satisfaction and unemployment rate in the sector and the contributions towards the economic growth and development in the region, Pearson

simple correlation and ANOVA regression analysis were engaged individually in accordance to study objective:

a) Correlation analysis between ASGM Cooperative self-satisfaction and unemployment rate versus the economic growth and development

Pearson simple correlation was completed to check the liaison and the results are tabled here:

Table 21. Pearson simple correlation matrix on ASGM Cooperatives self-satisfaction and unemployment rate versus the economic growth and development

		Economic Growth and Development	ASGM Cooperative self-satisfaction and unemployment rate in the sector
Economic Growth and Development	Pearson Correlation Sig. (2-tailed) N	1 144	0.860* 0.000 144
ASGM Cooperative self-satisfaction and unemployment rate in the sector	Pearson Correlation Sig. (2-tailed) N	0.860 0.000 144	1 144
*Correlation is significant at the 0.01 level (2-tailed).			

Source: IBM SPSS Statistics Data Editor

As shown in Table 11 above, Pearson's correlation coefficient r = 0.860** showed a very strong correlation with p = 0.000 stating that is its relationship is highly statistically significant. This shows that ASGM Cooperative self-satisfaction high with very low unemployment rate in the sector showing a very strong and positive correlation on the economic growth and development. ASGM cooperatives confidence in their current gold mining activities reinforce the need to stay in the sector thus reduce unemployment rate in

the region which automatically leads to the increase of economic growth variable. As a result, it confirmed the hypothesis that there is a very strong correlation between the two variables both the predictor and the dependent at r – coefficient of 0.860.

b) Regression analysis between ASGM Cooperative self-satisfaction and unemployment rate versus the economic growth and development

The results from simple regression analysis method of adjusted R2, f-constant values, f-coefficient, b-coefficient and t-value at 0.01 significance levels are accessible in the table below.

Table 22. ANOVA Simple Regression Model Summary on ASGM Cooperatives self-satisfaction and unemployment rate versus the economic growth and development

Model	R	R2	Adjusted R2	t-value	f-constant	Beta coefficient	Sig	Std. Error of the Estimate
1	0.860[a]	0.740	0.738	20,400	403,713	0.883	0.000[b]	0.672
	P<0.01 a. Dependent Variable: Economic Growth and Development b. Predictors: (Constant), ASGM Cooperative self-satisfaction and unemployment rate in the sector							

Source: IBM SPSS Statistics Data Editor

From the outcomes, the R-squared value of 0.740 is particularly high compare to finance margin of 0.7 which settles its strong level of standpoint showing a strong and high relationship. The adjusted R2 of 0.738 forecasted exclusively the economic growth and development at 73.8% of the variance from ASGM cooperatives self-satisfaction and unemployment rate in the sector. Alternatively, the t-value of 20,093 reflected a high statistically significant regression. The regression f-value of 403,713 disallowed in toto the null hypothesis. However, the regression beta coefficient of 0.883 > 0.5 indicated that ASGM cooperatives self-satisfaction and unemployment rate in the sector foresees the increase for every one unit of D.I in the country economic growth and development by the

aforementioned amount. The standard error estimate of 0.672 seems acceptable. In summary, the regression analysis used to test these two variables confirms the statement that there is a very strong high level of significance in the relationship between ASGM Cooperative self-satisfaction and unemployment rate versus the economic growth and development in the Province of Ituri/DRC.

4.6.4 Infrastructure Development & Sports and Charities Donations to the local Community

To estimate ASGM cooperative contributions towards infrastructure development & sports and charities to the local Community and its impact on the growth and development in the region, Pearson simple correlation and ANOVA regression analysis were involved and the results are as followed:

a) Correlation between ASGM cooperatives infrastructure development & sports and charities contributions to the local community versus the economic growth and development

Pearson simple correlation test results are presented in the table down.

Table 23. Pearson simple correlation matrix on infrastructure development & sports and charities contributions to the local community versus the economic growth and development

		Economic Growth and Development	Infrastructure Development & Sports and Charities Donations to the local Community
Economic Growth and Development	Pearson Correlation	1	0.464*
	Sig. (2-tailed)		0.000
	N	144	144

Infrastructure Development & Sports and Charities Donations to the local Community	Pearson Correlation Sig. (2-tailed) N	0.464 0.000 144	1 144
*Correlation is significant at the 0.01 level (2-tailed).			

Source: IBM SPSS Statistics Data Editor

As exposed in the above Table, Pearson's correlation coefficient r = 0.464** and p = 0.000 was found and it showed a fair positive correlation between ASGM cooperative infrastructure development & sports and charities contributions to the local community and the economic growth and development just at fair r-coefficient of 0.464. This conclusion stimulated some of the contributions made by ASGM cooperatives through infrastructure development & sports and charities to the local community affected rationally the country economic growth and development with balanced and fair positive correlation between these two variables.

c) Regression between ASGM cooperatives infrastructure development & sports and charities contributions to the local community versus the economic growth and development

The followings are the results from ANOVA regression analysis techniques of adjusted R2, f-constant values, f-coefficient, b-coefficient and t-value at 0.01 significance levels that were tested:

Table 24. ANOVA Simple Regression Model Summary on infrastructure development & sports and charities contributions to the local community versus the economic growth and development

Model	R	R2	Adjusted R2	t-value	f-constant	b coefficient	Sig	Std. Error of the Estimate
1	0.464[a]	0.216	0.210	6,248	39,048	0.461	0.000[b]	1,167
	P<0.01 Dependent Variable: Economic Growth and Development Predictors: (Constant), ASGM Cooperative Infrastructure Development & Sports and Charities Donations to the local Community							

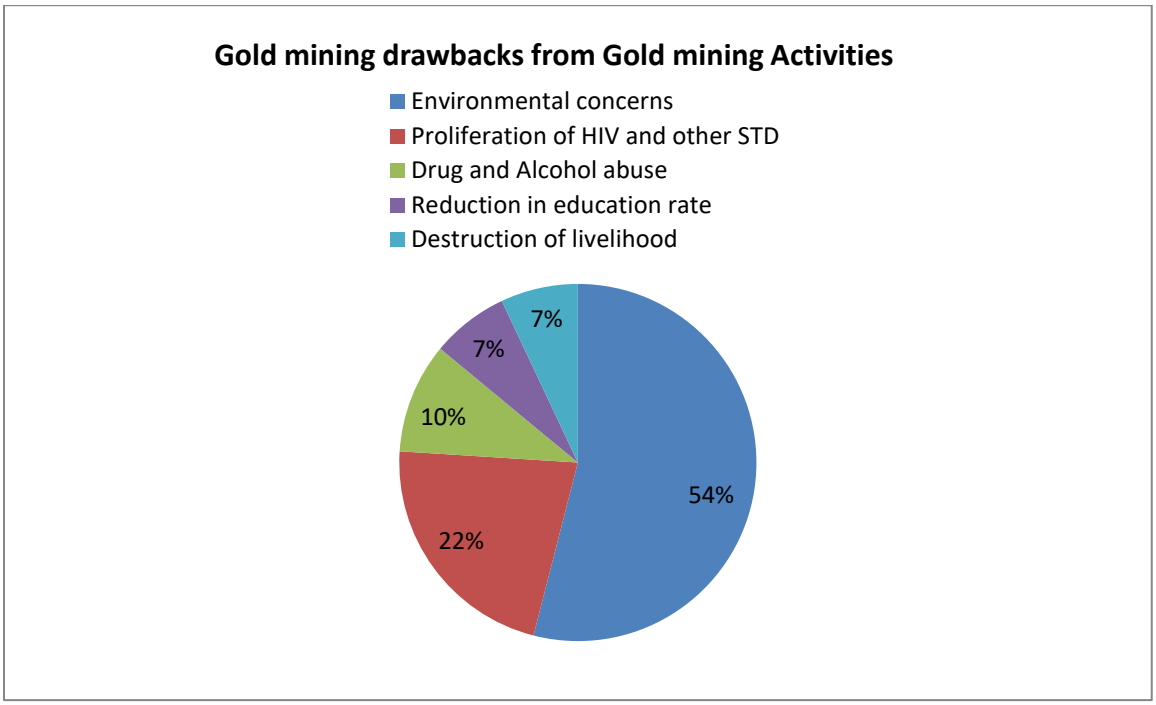
Source: IBM SPSS Statistics Data Editor

From the above table outcome, the regression model quantified the adjusted R2 at 0.216 valued demonstrating a moderate influence between the two variables. The adjusted R2 projected the country economic growth and development only at 37% of the variance following ASGM cooperatives Infrastructure Development & Sports and Charities Donations to the local Community. The t-value of 6,248 is considered to be prudently substantial since it is greater than 2. The f-coefficient of 42,954 > 2.5 endorses any hypothesis of rejecting the null hypothesis. The beta coefficient of 0.461 confirms ASGM contributions towards the community social development thus the growth in the region by the same level in any unit of increase in the variance. The standard error estimate of 1,167 is very much greater than 1 perfect positive. The Anova regression study therefore established the hypothesis that there is a moderate positive significance in the relationship between ASGM cooperatives Infrastructure Development & Sports and Charities Donations to the local Community and the country economic growth and development in Ituri Province of the Democratic Republic of Congo.

4.7 Some of the Drawbacks from the ASGM gold mining activities

The following are the bash of some of the gold mining drawbacks pinned out by ASM cooperatives respondents as demonstrated by factual details approving the observation listed down in Table 19 below. Moreover, the top-down listening was based on the background knowledge and the significance of the each and every element given by ASGM respondents to create meaning.

Figure 3. Gold mining drawbacks by ASGM respondents' perception



Source: Research Primary data

4.7.1 Environmental destruction: From 54% of the total ASGM cooperative interviewers, environmental took the lead with 78 votes as the first shortcoming of gold mining activities in Ituri province.

4.7.2 Proliferation of HIV and other STD: In the second place, the proliferation of HIV and other STD (Sexual Transmitted Diseases) was tabled as the worst drawback of gold mining activities embodying 22% of the total appraisers.

4.7.3 Drug and Alcohol Abuse: 10% of ASGM cooperative respondents pinned down Drug and Alcohol abuse as one of the gold mining shortcoming effects leveled

4.7.4 Reduction in Education Rate: Another 7% of the total interviewers listed the reduction in education rate in the region as one of the side effects of the gold mining in the region enumerated.

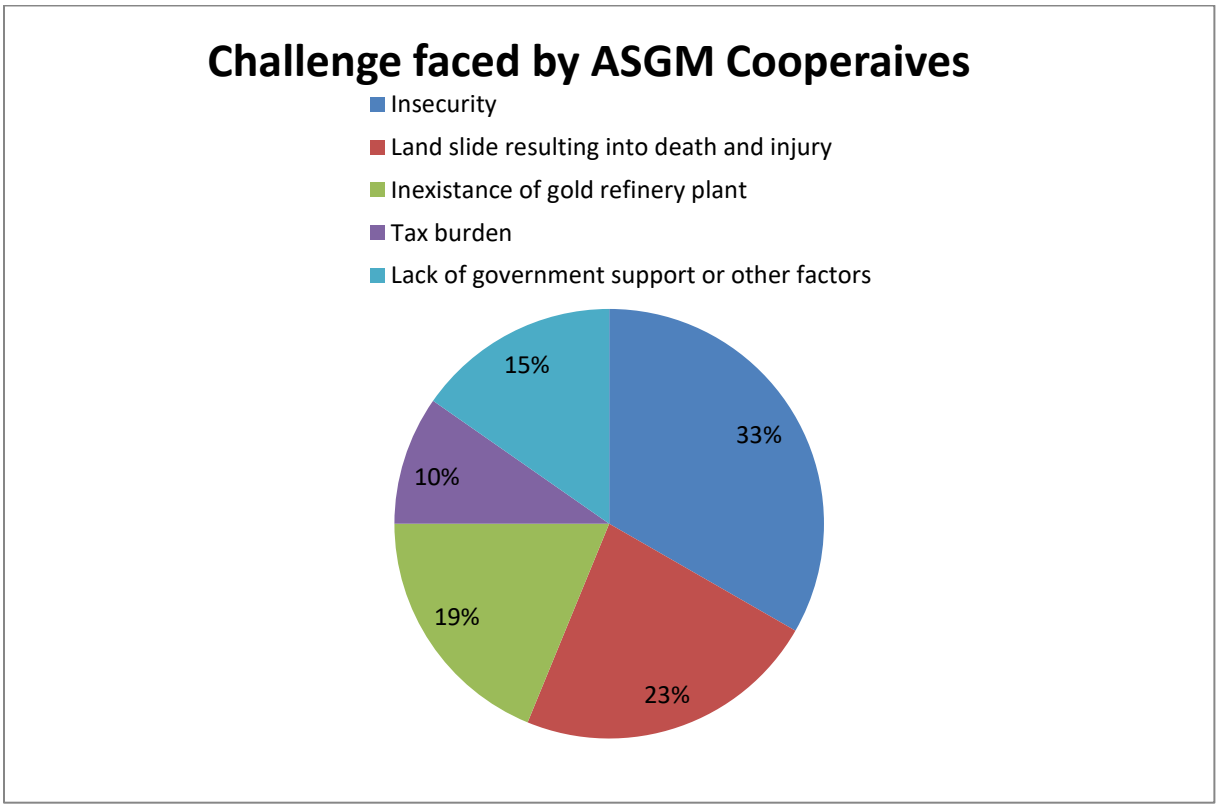
4.7.5 Destruction of the Livelihood: The last of the foremost consequence pointed out by ASGM respondents was the multiple destruction of livelihood for

mining among the long-established list at 7% out of 144 ASM members interrogated.

4.8 Challenges faced by ASGM cooperatives

Here are some of the bald challenges pointed so far out as an hinder which render ASM cooperatives quite difficult to make it prosper and benefit the Ituri province and the Democratic Republic of Congo at large. We intended to put them in figure in an ascendant order as mentioned from the first hand data collected. Details about countless challenges faced by ASGM cooperatives were listed down in Table 21 below. However, the process of top-down listening was guided by the background knowledge and the significance of the challenge labelled by ASGM respondents to create meaning.

Figure 4. Challenge faced by ASGM cooperatives



Source: Research Primary data

4.8.1 Insecurity in most of the mining sites: From the field findings, the figure revealed the insecurity caused by local miners as the lead challenge faced by gold mining cooperatives in the region with 33% rating

4.8.2 Frequent Land slide (resulting into death and injury): In the second place, land slide was listed at 19% as one of the main challenges they encountered in the course of their gold mining activities causing death and injury.

4.8.3 Tax Burden: The various taxes from different entities were also tabled at as one the 10% as one of challenges ASGM cooperatives are confronted to in the course of their business.

4.8.4 Foreign farm in the ASM sector: A group of ASGM cooperative members mainly chairmen pinned it out at 7% the presence of foreign nationals into that sector as serious treats to ASGM cooperatives activities.

4.8.5 Absence of the modern gold refineries in the Ituri Province: Research findings also discovered the inexistence of the modern gold processing plant being one of the prime challenges confronted by gold mining cooperatives in maximizing profit representing 6% from the total interviewers.

4.8.6 Lack of government support and subsidies to ASGM Cooperatives: The lack of government support and subsidies to ASGM Cooperatives countrywide was also quoted as one of the problems holding ASGM cooperative development at 5%.

4.8.7 Shortage of proper work material and protection: In the closing list, the shortage of proper work material and protection was tabled at 3% of the group interrogated.

CHAPTER FIVE
DISCUSSION ABOUT FINDINGS RESULTS AND CONCLUSION FROM ASGM COOPERATIVE IMPACTS ON THE SOCIO-ECONOMIC DEVELOPMENT IN ITURI PROVINCE

5.1 Introduction

This study was guided by the Economic Impact Analysis (EIA) and the Social Impact Analysis (SIA) based on welfare principles ratified in Chapter IV of Revised Mining Code 2018 Law n°18/001, March 09th 2018 as regards the Social Responsibility in DRC Mining sector which recommended that ASM should operate under cooperative umbrella in order to fully contribute to the country social development and economic growth. As noted earlier in chapter one of this thesis, these principles allowed the researcher to examine how ASGM cooperatives activities impacted the economic growth and social development by leveling indicators such as impact on income, number of jobs created, tax revenues, and other social aspects like poverty, unemployment rate in Ituri Province.

In line with the above welfare models, the researcher depended upon the findings presented in chapter four to make a case about the factual results from ASGM cooperatives on the Country economic growth and social development portraying their wellbeing and progress along the following five lines: the nature and context of ASGM activities region, the foremost reasons driving new gold miners into gold mining business, ASGM cooperatives both social and economic contributions to the country economy backed by socio-economic growth variables, reviewing some of the ASGM operations' drawbacks and to conclude with a number of challenges affecting ASGM cooperatives in Ituri.

5.2 Discussion about the nature and the organization ASGM sector in the Democratic Republic of Congo

Discussions about the nature and organization ASGM sector in the Democratic Republic of Congo under study here were conducted against the contextual situation from other parts of the word in relation to the nature, structure and demographic aspect of population of ASM worldwide utmost in line with the Country mining law termed as the Revised Mining

Code 2018 (Law n°18/001) of March 09th 2018. From the research findings, the following features have been discovered:

5.2.1 Artisanal and small scale gold mining (ASGM) as a Formalised Sector in the Democratic Republic of Congo

From the research findings presented, ASM sector in the Democratic Republic of Congo had been formalized following the 1982 Mining Liberalization. It was fully legalized from the informal mining sector to formal sector by the Presidential Decree-Law No. 82-039 on November 5, 1982. When challenged about the legality of their activity in different gold mining sites, the majority of ASGM respondents confirmed abiding by law in their gold mining business which has been well regulated by the government.

To date, ASGM sector continues to be seen as a big relief to many citizen in the country as an important sector where the government could rely on for its prosperity, growth and development. The provision of the above mining law Article 111 & 111 Bis recommended that all ASGM should form and undertake their mining activities through mining cooperatives in order to contribute to the government relief initiative and fund the social development and economic growth. In that perspective, the government could grant them a permit to get the artisanal zone for exploitation (ZEA: Zone d'Exploitation Artisanale). Some fields research data further revealed that ASGM cooperative could be allowed by 2025 to transform their ZEA into acquiring Mining Survey License (Permis de recherche minière) and eventually proceed to get the Mining Extraction License (Permis d'exploitation minière) a right reserved only to large scale mining companies.

According to researchers, a move to formalize the ASM sector by the legislators had been acknowledged as a good decision to reduce the negative social and environmental mining impacts to uplift rural source of revenue and house income by providing formal titles for ASM concessions to get more people benefiting from it in the Democratic Republic of Congo (Hilson et al., 2019; Hirons, 2020). Therefore, the RDC ASM sector formalisation resourcefulness took us to learn an important lesson on the formalisation process from countries such as Guyana, that have gone further along the road to say that even in

jurisdictions in which ASM is legal, and generally miners have legal title to the land that they are working, shades of formality exist (Hook 2019b,d).

Drawing back, this important finding piloted by the researcher leans towards reversing the results of major studies, which exhibited ASM as a voluntary disregard sector in many countries such as South Africa, where Zama Zama mining, a local term referring to artisanal mining was considered as informal and illegal sector. Contrary to the Democratic Republic of Congo's situation, South Africa artisanal mining activities are conducted without a mining license whereas small scale mining companies typically have a legal mining title and their operations are predominantly mechanized. As a result, most artisanal miners work illegally in South Africa, in abandoned or decommissioned mining sites, and their activities in operating mines occur without the permission (Mwandiringana and Ye 2023: 1). In summary, the need to benefit from the ASM formalisation in RDC has to contextualise in the best interest of the country development in countries where the process are still under study.

5.2.2 The population of ASM gold miners tends to increase over the years in Ituri Province

The research findings revealed a total number of 445 gold mining sites in five belts named Kilo, Mambasa, Ngaya, Nzani and Panga in Ituri province. Nevertheless, the mystery surrounding the exact number of a total population of ASGM active in gold mining in Ituri Province can be explained mainly by the insecurity and the inaccessibility of some of mining site. Thus, our 168,145 ASGM population estimation remained somehow exhaustive and approximate despite a 2020 study by IPIS has mapped about 2,951 mines, employing 427,469 artisanal miners in eastern DRC alone (IPIS Webmap, 2020), a bold statistic linking four DRC provinces with all categories of natural resources including.

Documented report (SAEMAPE 2024) indicated 15 active ASGM registered cooperatives in Ituri Province. The Extractive Industries Transparency Initiative (EITI 2023) put the total figure at 143 including ASGM cooperatives with the registration in progress. The full list of legally registered ASGM cooperatives is on (appendix v).

5.2.3 The demographic aspects of ASM Gold miners is far and wide a male dominant in the Democratic Republic of Congo

Analyzing gender feature from finding, only a quarter per cent of ASGM proved to be female. This finding seemed to be accurate because most of ASGM cooperative works are typically a man's job on sites. Women are rather active in transport and washing of the sand, powder or others women's related jobs in the mining sites such as catering, sales, and accommodations (Appendix vii & xviii).

Screening further, the majority of gold miners were below 45 years leading to a conclusion that the majority of ASGM Cooperative members are young. The average length of experience for active miners is 10 years. It somehow endorses the findings from different reports such as the Delve data platform, whereas 40.2 million people were working in ASM in 2017, among which 30% women Sub-Sahara Africa counted almost 12 million ASM workers, among which two million are based in DRC (Delve, 2020).

5.3 Discussion about the main reasons driving new gold miners into ASGM sector: Need to create wealth, lack of alternative employment and poverty on top tally

Reasons from the fields are combined into three narratives like the need to get job, earn something and fight poverty. As the saying goes "with gold digging one can quickly get rich, start own business and escape poverty. This has been confirmed by the spot on lack of formalized job, trailed by wealth creation and followed by the aspiration to escape poverty.

The lack of alternative employment in Ituri Province appeared as the principal get-up-and-go factor for many young people to join ASGM and try their luck into gold mining sites. They considered gold mining as the main source of income opportunity that might help them to come out of poverty and gain work as well as providing livelihood for their respective family.

Thought a number of ASGM cooperative members pointed out the fact that the region has been turned into mining sites leaving no option to continue firming, other research findings exposed that farmers largely participate in ASM for supplementary income to support their livelihood and farming activities. This was supported by a qualitative study done in northeastern Guinea to perform a root-cause analysis to identify the factors contributing to

the ‘migration’ of farmers to ASM (Osumanu, 2020). Therefore, smallholder farmers are faced in Guinea, with increasing incidents of droughts, increasing temperatures, and rainfall that have disrupted their efforts to grow their farm crops and to produce food and generate income (Ceci et al., 2021). According to Osumanu (2020) & Ceci et al. (2021), an increasing number of smallholder farmers are more recently moving into ASM, where the farmers believe it to be less vulnerable to life stressor. This phenomenon has received more attentions in sub-Sahara Africa where an expanding body of literature showed that small holder farmers were engaged in ASM because of low income earnings in agriculture but swift and good income in ASM (Osumanu (2020) & Ceci et al. 2021).

In addition, findings disclosed a score ten percent of ASGM as school dropout students going to gold mining sites. After analyzing the motivator, it was obvious that the need to get rich and find something influenced their decision-making. Thought empirical evidence from Ofosu, Dittmann, Sarpong, & Botchie research report (2020) revealed that small-scale mining activities in mineral rich countries in Africa reduce education attainment and learning. However, field’s results discovered that most of the gold mining operations in Ituri province took place in ASM sites where a number of institutions of learning were reduced like in Mabanga, Lodjo, Mayuano and Nzani mining sites.

In summary, apart from some of the lawbreaker miners escaping lawsuits, our research demonstrated that most of the Ituri gold miners embraced ASM activity as a sustainable livelihood, source of wealth where they could take an opportunity to start a prosperous business out of it.

5.4 Discussion about ASM cooperatives ‘contributions to the country economy backed by economic growth variables

Analyzing the findings from the following indicators revealed the following sightings:

5.4.1 ASGM cooperative consumer spending goes beyond the minimum 3 USD daily expense in Ituri Province

As mentioned earlier, the Revised Mining Code 2018 (Law n°18/001) of March 09th 2018 recommended that ASM Cooperatives should direct their actions towards the country economic growth and development by directing their policies on building a safety net

system to consolidate the benefits of investments in human development and foster household resilience. In the case of ASGM cooperatives members' living standard directed on consumer spending estimation, it was observed that these matters regarding the gold miner's daily expense could turn into determining factors that alter their consumer spending rate either below or above the poverty rate. In cross referential analysis, the correlation coefficient placed at 0.918 between the ASGM cooperative living standard versus the economic growth and development was very strong and its significance was very high. From the above ending, ASGM cooperatives daily living standard remains the fist key indicator in terms of economic growth and development contributions by the artisanal gold mining sector.

Thus, findings out that majority of ASGM cooperative respondents could afford a daily living standard of 3 USD positioning them above the international poverty rate line recommended by the International Monetary Funds at 2.15$ per day and per capita (IMF report 2023). This was a fact checked endorsing the polemic surrounding the extravagant life of gold miners known locally as "Ambianceurs" on sites with frequent lavish overnight parties in Ituri province. This point of outcome gave the impression to be supported by some evidence from secondary data for instance the World Bank report, in which it is observed that some gold miners in Africa spend irresponsibly their hard earnings profits (World Bank, 2019).

From his evidences obtained during data collection, gold miners daily earning do variety from 3 USD to 10 USD (Miners working for COOMISARA and COOMINDEF cooperatives) without including the free provision of meals and drinks by the AFM or the owner of the gold mining workshop. The present findings corroborated discoveries made and affirmed in Chapter one problem statement by de Brier et al. (2020, 9) about the cobalt miner daily earning in RDC Lualaba province.

Other contributing factors to the situation of consumer spending indicator included work psychosis, high rate of bars, nightclubs, and luxury goods and entertainments activities on mining sites in respect to ASGM life characteristics. The above elements highly affect the daily spending of ASM members on mining sites. The findings indicating the widely held

ASGM cooperatives respondents sanctioned the present carpe diem life gold miner principles confirmed by the finding and further amplified by some economists which indicated that individual and household earnings does not limit people's choices in life especially on consumer spending (IMF 2023).

For instance, there were scenario and drama with some gold miners taking the whole bar or restaurant hostage by buying the whole crate of beers and foods just to spend the money. This explained the fact that the sudden gold earning money at times drives gold miners crazy to "recklessly spend their earnings" and thus hinders them from investing wisely for their future life's plan.

In line with the recommendations, DRC government should take over its responsibility to consolidate the benefits of ASGM investments in human development and nurture household resilience via SAEMAPE as its branch in charge of the responsibility to hold paramount the welfare of ASM cooperatives as well as their lavish spending.

5.4.2 ASM Annual income (GDP) of the ASM thriving the expectation in Ituri province

The Revised Mining Code 2018 (Law n°18/001) of March 09th 2018 mentioned that ASM Cooperatives should put their actions towards the country economic growth by empowering women and youth and providing them with the means and opportunity to contribute to and benefit from the development of the country as priority.

According to the research findings for case in point, the scale of the correlation coefficient benchmarking between ASGM cooperatives 10,000$ annual income among and its impact on the Country economic growth and development has been estimated at 0.619 hyped as moderate positive correlation. Among the reasons identified as the major cause of this good rate of ASM gold miners per capita income was the fact that Ituri province economy is fully grounded on gold mining activities. Most of the businessmen moguls and small traders have had their hands in the gold mining business. Accordingly, Ituri province population estimated at 8,120,000 Hab (OIM 2024) has been significant impacted by the gold mining activities, predominantly through foreign exchange earnings from gold sale outside the country in dollar currency, from multiple investments the precious metal and its

linkages with other sectors of the economy such as trade, housing infrastructure and small local industries development and outside the country.

Thus, the moderate significance score of 10.000 USD annual earnings as DI was reinforced by some evidence from a recent study (De Brier et al. 2020, 9) estimated that 3T miners earn around USD 2.7 and USD 3.3 per day in eastern DRC confirming per capita income of most small artisanal gold miners in Ituri Province. Furthermore, the rising numbers of some latest smart phones, motorcycles, vehicles, villa, apartments and other assets own by ASGM gold miners (Mungbwalu, Pluto, Mabanga, Niania, PK51, Bunia, Mambasa, Mahagi, Ariwara…) was considered as material proof of this high income rate among ASGM cooperative members. As mentioned in the previous sub title, our findings revealed a daily earning reaching 10 USD which sometimes does increase after the production because the social contract with AFM recommend that lowest grade (Boulonneur) should be counted up in the final step of the production allocation. From the above evidence, most of sequences of ASGM asset valuation were going annually beyond 10,000 USD threshold set in our research questionnaire to benchmark their real annual earnings.

Contrary to this finding, the IMF last recorded the Gross Domestic Product per capita in the Democratic Republic of Congo at 695 US dollars in 2023 with $1,474 (PPP, 2023) which is far less the researcher's findings. However, our fields researches findings refute this argument and assert that ASGM gold miner's earnings depends on the gold discoveries and are basically seasonal. Our findings have recorded a number of living cases of gold millionaires (USD) made through artisanal gold mining such as ATADENDLE, PAS A PAS, JOJO, ASENI, BARAKA without aforementioned heavy investments. In line with our findings, early estimation of ASM welfare and earnings couldn't be factors of economic assumption but factual data from the ground since the subsequent year 2023, there was a notable increase in ASM output worldwide (Gold production), with a rise of 43% to reach a total of 361,241 ounces (Yuan et al., 2023).

Therefore, the above instances based on the amount received, ASGM cooperatives' annual income are benchmarked from their various economic activities derived from gold mining business although the per capita income principle demands that the sum of all production

and services throughout the year should be considered. Ituri ASM gold production as an important segment of the economic growth should raise awareness among government authorities in the country to get insight and examine possible solutions to its economic contributions' details. From the above windup, ASGM cooperatives annual income is definitely considered a strategic indicator in regards to ASGM economic growth contributions.

Further still, it is very important to go beyond the limited concept of "ASGM little contributions to the economy" and expand it to include their real earning from the gold digging, and this can best be achieved through engaging in research initiatives in the five gold belts disseminated in Ituri province (Kilo, Mambasa, Ngaya, Nzani and Panga) that could lead to developing practical indicators for estimating ASGM per capita income contributing the country economic growth and development.

5.4.3 ASM activity as one of the main employment driver in Ituri province

In his second term presidency, his Excellency the President Felix TSHISEKEDI has put the employment segment as his first priorities especially in SME sector (Small and Medium Enterprises) among which ASM cooperatives as pioneers. For that reason, several other initiatives were also developed by some NGO's and international organizations in terms of programme, project, policy and legal frameworks to advocate for better job creation within ASM sector.

In that perspective, the Revised Mining Code 2018 also recommended that ASM Cooperatives should direct their engagements on the way to the country economic growth and development by centering their policies on widening the benefits of growth through policies to support employment in order to create more jobs. As the World Bank 2019 pointed it out that combining ASM's direct labor figure with its indirect one, the scale and possibility of ASM's contribution to livelihood and economic growth assume a greater significance, in those viewpoints, it is estimated that at least 134 million people work in related industries that support the ASM sector worldwide (World Bank 2019, 71).

Bearing in mind that the main goal of ASM formalisation was to address the unemployment high rate in the then Republic of Zaïre (currently DRC), our current

findings estimated that the ASGM sector informally contained a total of 168,145 gold miners (provisional statistics from the research finding) spread in the five gold belt in Ituri Province out the population of 8.1 million (Ituri Health Division 2023). From the outcomes that demonstrated some gold miners have managed to set small business activities employing at least 5 more people and its incidence on the country economic growth and development with a moderate correlation coefficient of 0.601, we might guess that good number people in Ituri province survive from gold mining business constituting. From the moderate positive significance with beta coefficient of 0.585, the figure is likely to go up if all gold mining sites that have inaccessible dwellings could be taken into accounts. Definitely, ASGM cooperatives incentives to create job to boost employment sector in the region are reflected as good economic indicators to the country economic growth and development.

Another research report showed that the ASM sector has emerged as perhaps the most important non-farm rural source of employment in sub-Saharan Africa in recent years (Hilson et al., 2021). A 2020 study by IPIS has mapped about 2,951 mines, employing 427,469 artisanal miners in eastern DRC alone (IPIS Webmap 2020). This is a live proof that ASM is achieving that the government goals that have developed to address the country employment rate problem by emphasizing the mining sector aspects.

Though some ASGM members acknowledged the government efforts by giving big tribute to for the 1982 ASM liberalisation and legalisation, a number of fields evidences clearly pointed out that gold mining do generate others employment sources which are also on the increase in the mining regions.

5.4.4 ASGM Tax Contributions among the privileged DRC taxpayers

Tax contribution positions itself as a crucial vector in any country economy. As The Revised Mining Code 2018 (Law n°18/001) of March 09th 2018 tabled it, one the aim of the government to liberalise the ASM activities from illicit to formalise sector was to fund its budget for the economic growth through tax contributions. That is why the DRC legislators recommended that ASM Cooperatives should direct their actions towards the country economic growth and development by focusing their policies on laying the

foundation for future productivity through improved working system and building a safety net system to consolidate the benefits of investments in human development and foster household resilience (Revised Mining Code, Law n°18/001 of March 09th 2018).

From field data, the findings revealed that most of ASGM cooperatives interviewers agreed on the facts that they honour their tax obligation because government official are always on their necks from the mining land registration to gold certification. Going further to investigate different taxes paid last year, contributions to national government coffers seemed to be greater than the provincial tax inducement. Moreover the traceability of these taxes remained unchecked reasons being the rampart corruption and insecurity in the region. Therefore, the factors that bias ASGM cooperatives ability to fulfill tax obligation are many and are somehow interconnected. Its incidence on the economic growth and development was correlated at 0.801 scoring a very strong correlation with a very high significance. As a traditional economic indicator, this outcome positioned ASGM tax contributions among strategic indicators to economic growth and development in the region.

According to Extractive Industries Transparency Initiative (2020), the Democratic Republic of Congo economy remains dependent on mining products, which makes it vulnerable to global price fluctuations. In 2017, the mining sector generated USD 168 billion accounting for 17% of GDP. Together with oil and gas, the mineral sector accounted for 98% of DRC's exports (EITI 2020). Further investigations showed that country that has a political stability prove to reap a lot from the artisanal and small sale mining. Research reports from Owusu et al. (2019) support the above given findings by pointing out the republic of Ghana where Artisanal mining has accounted for at least 30% of the total gold produced in Ghana since 2011 (Owusu et al. 2019).

As Brottem and Ba (2019) predict that the state of the Artisanal and Small-Scale Mining Sector from 2020 to 45 will probably stimulate the economic growth following the general claims or observations made about how individuals engaged in ASM rein- vest monies or create demand for other services locally (Brottem and Ba 2019).

Subsequent to such revelations, the Democratic Republic of Congo should reform its ASM policy requirements and laws to foster insecurity in order to benefit from the sector and increase ASM revenue contributions.

5.4.5 Trade and Investment shaped by ASGM Business in Ituri Province

However, conferring to the research findings for example, the level of ASM responses the backbone of the trade and investment in Ituri Province is a factor of gold mining in the area. And it has been recognised by majority on the facts that they invested the revenue earned to set some enterprises. Although, most of gold mining sites are a perfect market place where both locals and foreign traders interact, findings reveals that most of the province businessmen have originated from gold mining activities and till to date, the majority of them continue to reap well from the sector. In addition, large quantities of imported goods end up in the gold mining site (Ituri Division of the Economy 2023).

According to the president of the federation of enterprises in Ituri province, Mr. LONEMA MUKWA who also owns gold mining cooperative called COOMICO, the precious metal has opened the international market for them from neighboring countries to overseas (Asia, America and Europe). The bulk of Ituri gold productions are smuggled out of the country. As a result, revenue earned mostly in foreign exchange is used by smugglers to import goods and services from neighbouring countries. Evidence from some of fuel importers from Eldoret in Kenya revealed that traders who come with gold are the first served and discounted. Actually the same situation prevails for consumer goods in some neighboring countries such as Uganda and Rwanda. This is the consequence of the inexistence of gold refinery and jewelry industry in Ituri province.

In line with our findings, Radley (2019) noted that ASGM miners in South Kivu have been observed to capture between 87% of the value generated by their production. From the approximately two thirds going to managers and workers, investments have been observed in agriculture, livestock, education, dowry, property, vehicles, motorcycles, commerce, and transport (Radley 2019).

The figures highlighted the importance of study on the issue of ASGM sector to avail statistics and viable information. Meanwhile such findings could be very instrumental in

developing investment and trade variable to determine ASGM cooperative real contributions to the country economic growth. The correlation coefficient was estimated at 0.552 portraying it to be fair and positive with a variance beyond any reasonable doubt for it to be considered among key indicators for economic growth and development in Ituri province.

This supported evidence raised the need for policy makers and other partners to more take insights on the gold business to both the production and the commercialisation. The revenue earned has to be invested in the country economy in order to boost the country infrastructure development.

5.4.6 ASM gold miners taking the lead into the province housing sector expansion

As an economic growth indicator, housing sector has both social and economic effect on region development of the region. Abiding by DRC Revised Mining Code 2018 (Law n°18/001) of March 09th 2018, ASM Cooperatives were conveyed to put their efforts towards the country economic growth and development by focusing their policies on contributing to increase the level of province infrastructure development (Revised Mining Code Law n°18/001 of 09/03/2018).

According to the research findings on ASGM cooperatives' perception of housing, owning housing and plots is a must for every gold miner. The research outcomes confirmed that gold mining business has facilitated many to acquire lands, plots and furthermore to own a house. Its correlation was estimated at 0.552 with a fair margin of relationship. No doubt, housing sector shaped by ASGM cooperative is a strategic indicator for live economic growth and development in Ituri region. So, the present findings tend to be noteworthy to Democratic Republic of Congo in a way that it could help to absorb and cope up with the wave of urbanization rate stated at 47.44% of the share of the population living in urban area (UNDP 2019).

This view beheld as an exaggeration of what can be snatched as the real estate business yet their mere contributions (ASGM housing contributions) are of an important give out to the community and the country at large. Although, some of the housing constructions did not meet the modern housing sector standard but they somehow contributed to the country

development and highly transformed the region urban area such as Bunia town with some amazing three stars hotels build by ASGM cooperatives tycoons like Gold star hotel, Sir Alex Hotel, Cosmos Hotel, Hotel de la Province.

Moreover, ASGM cooperatives who were interviewed engaged in urban house building and plots sale sustained that there is no government projects put in place to build affordable housings for the citizen in Ituri province since Independence Day June 30th, 1960. So, ASGM members venturing in this sector constitute a relief for the community who positively encourage it as ASGM cooperatives social responsibility and upright determination in promoting development and infrastructure to contain the pressure of the province high rate of urbanisation.

In view of the case of Ituri ASM gold cooperatives participating in building the province housing sector, DRC government and other development partners should consider supporting this valuable ingenuities and examine possible solutions to expand it to other Provinces. Further still, using ASGM mining returns to build the country must be part of government development plan in the future.

5.5 Discussion about ASM gold mining social initiative towards the community backed by social development variables

5.5.1 Education support

Following the Revised Mining Code 2018 call for ASM Cooperatives to direct their actions towards the country social development by centering their policies on contributing to reduce the rate of unemployment in the region, In additional case in point targeting contributions towards siblings education and health, emphases were engaged on the number of dependents or siblings, these ASM cooperatives members supports in secondary school and university because the government has decreed a universal free primary education from 2021. A good number agreed paying siblings school fees mostly at secondary level and in university.

There were also some cases where some of the wealthiest gold miners who are managing to take their siblings overseas like in China for advance university's studies. Amazingly, some

of students found on the mining sites confessed that the gold mining business was the only source of self-sponsorship especially during the holiday season. Hence, the correlation coefficient result was estimated at 0.659 showing a moderate relationship between the education support and its impact on province development. That illustrates how important ASGM cooperative value their siblings education. Since the universal primary education programme is scrambling to take off, the government should back ASGM cooperatives because their sheer contributions towards education sector development are so much appreciated by middle class families.

5.5.2 Family care and support

To further investigate the impact of ASGM cooperative on poverty eradication in Ituri region, one respondent challenged our team by saying if the government could reconsider its decision to bar ASM miners from the mining sector, the direct consequence could lead to a nationwide disaster with recession and inflation, rising in unemployment and poverty rate to resurgence of conflicts and wars.

From various researches, scholars widely agreed that ASM helps to reduce poverty in the areas where it occurs (Arthur-Holmes, 2021). Further investigations were done on the family care, health support to gauge this special social indicator of poverty rate among ASGM cooperatives members. The first subject matters elements revealed that most of the miners take care of a good number of dependents surviving from gold mining activity. From a total number ASGM cooperatives working actively in different sites, the findings attested taking care of their dependents from the benefits of mining activities is a necessity.

Weighing the correlation degree between the above variable and the social impact on the region development, the outcome was so impressive with a very high significance and very strong correlation of 0.825 coefficients. This is probably the lively probe that family care rests the most important need to every mankind in regards to physiological necessities. Following the above outcome, family care and support by ASGM cooperatives is rated among key indicators for social development in the region.

While scholars and international organizations point to the positive role of artisanal mining in poverty reduction, others argue the evidence is mixed, an urgent need to reforms the

ASM sector might be paramount to the government business according to the country mining legislation.

5.5.3 ASGM self-satisfaction and unemployment rate

As the Revised Mining Code 2018 recommend that ASM Cooperatives to straight their activities towards the country social development by building a safety net system to consolidate the benefits of investments in human development and foster household resilience (Revised Mining Code Law n°18/001 of 09/03/2018), factual data demonstrate that artisanal god miners are striving daily to develop the resilient capacity through the gold mining business despite the insecurity and other drawbacks factors around mining sites.

Gauging the rate of unemployment in some ASM sites, the responses were almost the same "We' have come here in the site to work. So if you question is about the formal or informal job, the answer is we do make living out of it, buy plots, motorbikes, cars and build houses…" Thus, no one that could go to the mining site and claims to be lacking work to stay idle in the bush. This evidence is confirmed by a very strong correlation with a coefficient of 0.860 placing ASGM cooperative unemployment rate very high among key factor development for economic growth in the region. Some reviews data from Hilson et al. (2021) and others commend the statement arguing ASM sector has emerged as perhaps the most important non-farm rural source of employment in sub-Saharan Africa in recent years. Up to eighty percent of the value of ASM gold is paid locally, and ASM generates 15–20 times more employment than industrial mining. Associated economic activities make four times more people reliant on ASM than the actual number of miners worldwide (Hilson et al. 2021).

One of the factors rendering ASM sector more significant and robust is the entry barrier suppressed through liberalization of 1982 making the access easier to people without formal education, skills or capital. Thus, performing tasks like gold hole digging, including crushing, washing or filtering require only determination and resilience.

5.5.4 Local Community Infrastructure Development Support Initiative

Further investigations were done to gauge the ASGM cooperatives social responsibility as their contributions to foster development in the region. Emphases were taken on infrastructure contributions, findings disclosed some of the ASGM cooperatives initiatives such as the rehabilitation of the local road, bridges, schools or health centers in the area they were operating in. The followings are some of the evidences: COOPEMI, Ituri mining cooperative contributed to the rehabilitation of the local road in Nzani belt named in 2022, COOMINDEF around the Mungbwalu-Lodjo road (on going), and COOMOI in partnership with are currently working on the Komanda-Yedi road in Mambasa belt that will absolutely alter the development in that part of the country (Link between Kilo and Mambasa gold belts) which had been cut off from other regions for several years. As a result of road, schools and other infrastructure's rehabilitations contributions, more people have escaped geographic isolation, saved transportation costs and attain education and health Centre. Its prevalence on the province development and economic growth was correlated at 0.464 a fair liaison with a balance significance. Consequently, it is a well thought-out its indicator to social development and growth in Ituri region.

5.5.5 Sports and Charities Donations to the local Community

From the perspectives of Sports and Charities Donations to the local Community, Gold miners especially Chairmen of ASGM cooperatives are known to be more "mécènes" generous sponsors for local charities and sports amateurs. Weighing their contributions to support the local community in those events, ASGM respondents approved their actions so significant to up keeping the youth leisure sector and assisting the local development in building social trust in sports and leisure sector. During most of "Harambee events" (Harambee is the Swahili word that refers to an event where the community comes together into pooling resources to fundraise a certain community projects such as school building, churches, … or any other community development infrastructure), ASGM cooperatives members are the chiefs guests and sponsors.

As Sudolska & Łapińska (2020) state it sponsorship is as a rule treated as a form of Corporate Social Responsibility's communication or the instrument to build the CSR

image. ASGM are well aware of its importance and do rely on it to interact with the communities. Local football team here like Mont-blue in Bunia always calls for gold tycoon called ATANDELE to get something whenever competing. ASGM Cooperatives appreciated more such initiatives aimed at support local or regional development, and thus assisting the local community linked socially. Accordingly, the philanthropic actions of ASGM cooperative are considered significant indicator to the region development following its fair correlation coefficient of 0.464.

5.6 Discussion about certain downsides of the artisanal gold mining in the area

Contrary to the recommendations of the DRC Revised Mining Code 2018 (Law n°18/001) of March 09th 2018, a number of artisanal gold mining drawbacks that poses serious threats to the region as well its fauna, flora and the population. Pinned out during the course of the research journey, this section tends to analyse and discuss the inner object.

5.6.1 Environmental Destruction

The Impact of ASGM operations are so devastating in the region with pollution of water and deforestation around the mining sites. As stated by many interviewers on the effects of ASGM gold mining activities in Ituri, environment damage seems to be the most horrible shortcoming of gold mining activities because its effects can be overspread to more generations in the future.

Water pollution remains the first live example. The process of filtering both alluvial and elluvial gold treatment with widespread use of mercury & cyanide leaching have turned countless rivers to become more polluted like the Abombi, Ituri and Shari rivers. As result, huge amounts of mercury and cyanide residue are released into waterways negatively affecting the water biodiversity such as fish populations and other animals in the national okapi reserve wildlife of Epulu surrounding both Mambasa and Ngaya gold belts (Appendix vi, viii & x).

In addition, the deforestation perpetrated by gold miners in search for precious metal constitutes a big risk affecting Ituri province environment protection. A number of pictures taken from field give evidence showing parts of equatorial forest that have been much devastated due to the ASM gold mining activities around Mambasa, Ngaya and Panga gold

belts (Appendix xx). In line with our findings, the Global Forest Watch testified that gold miners flock to the Ituri and other rivers in search of gold led to the reserve lost 1,350 hectares (3,336 acres) of primary forest in 2022, according to analysis by monitoring platform Global Forest Watch, that's up from 979 hectares (2,419 acres) in 2021 to 844 hectares (2,086 acres) in 2020 (Global Forest Watch 2023). This call to protect the forest and fauna has to be an international concern because findings showed that ASGM operations are causative to deforestation primary to open new roads leading to discovered mining sites and secondly to timber used in building underground hole protection and other activities.

5.6.2 Proliferation of Drugs abuse, HIV and other STDs

Gold mining site as a wide market place is confronted to various social challenges such extensive prostitution, alcohol consumption and drug trafficking. As a result, our findings recorded high of drug abuse, the spread of HIV and others sexual transmitted diseases. In line with our findings, Ituri province health division established that the rate of HIV among gold miners in Ituri province is very high because sexual exploitation, abuse, and harassment are so frequent in the region mainly controlled by militias (Provincial Heath Division 2023).

5.6.3 The use of military explosive

One of the dark sides of ASGM sector is lack of expertise as revealed by our finding outcomes. For instance, artisanal mining use of military explosive to crash rocks is not prohibited by the Revised Mining Code 2018 (Law n°18/001) of March 09th 2018 from the Democratic Republic. Despite the warning, observation data long established its use by ASGM miners exclusively through underground operations for extracting elluvial gold in area such as Mabanga, Mungbwalu, Russie and PK 45 & 51 (Appendix xii). As a matter of fact, numerous gold mine accidents have been linked to the improper installation of explosives at mining sites like on August 27th 2024 whereas a landslide occurred in Mbijo mining sites in Djugu territory, Ituri, causing the deaths of three gold miners and injuring five others (Appendix xiii &xiv).

5.6.4 Reduction in Education Rate

The reduction in education rate especially in the nearby mining sites portrayed the dark side effect of the gold mining in the region. Our finding results demonstrated a decline in student and teaching staff population, uncontrolled child labour and lack of formal education infrastructures, repeated militias insurgencies as factors contributive to the recurring obstacle to the education sector around mining sites. A live picture (Appendix vi) showing our researcher interacting with a stone crusher miner visibly being under eighteen years proved the extent at which children are forced to work into gold mining instead of going to school.

In line with our finding, numerous literature reports also hold over the effects of natural resource on education could be alarming when there is a mining site within the area. For instance, Ahlerup et Al. (2020) found that individuals who had gold mines within their district when they were adolescent have significantly lower educational attainment. This factor is supplementary explained by some myopic educational decisions when employment in gold mining is an alternative (Ahlerup et Al. 2020).

5.6.5 Destruction of farmland and livelihood

Agriculture sector is doubled affected by mining operations as long established by some of our ASGM respondents interrogated. From observations, water pollution, repeated soil erosions and displacements are basic causative to bring about reduction into arable farmland thus impacting more on the agriculture sector (Appendix xv). Many scholars have drawn attention to the evident damage by saying that people living around mining sites have been always compelled to depend on subterranean water sources, such as boreholes and wells, for the purposes of potable water and agricultural irrigation (C. ChangZheng Li and Umair, 2023, Li and Umair, 2023). On the other hand, the discovery of new mining site in farmland force the owner to destroy the crops at any cost as seen at Russie mining site around Mambasa belt whereas cocoa plantations have destroyed in detriment of gold mining extraction (Appendix ix).

In summary, the call for environment protection as commended worldwide remained disregarded around the gold mining in Ituri. Therefore, strengthening the systems for

environmental protection and conservation should become a priority to Democratic Republic of Congo policymakers. Partnership between ASGM cooperatives and SAEMAPE to serve as effective watchdogs could be effective in the long run because they constitute part of the problem. So, sensitization and laws enforcement should be done in order to reduce other vices as enumerated in this section enlightening some of gold mining drawbacks in order to reduce environmental impacts, reforestation, child labour and the rate of HIV, .

5.7 Discussion about various challenged encountered by the ASGM Cooperatives

Despite the law provisions and other regulations, Ituri ASGM cooperatives are still confronted to a number of challenges hindering their efforts to fully support the country economic growth and social development. The above section therefore leans towards discussing in details some of the main challenges (Chap 4, figure 4).

5.7.1 Persistent Conflict over mining site control

As Marcus Tullius Cicero (106-43 ante J.C) quoted “The sinews of war are infinite money”. Our findings revealed that conflict in Ituri is somehow correlated to the control of the gold mining. Local warlords from multiple militias group such as CODECO, ZAIRE, MAPI, Auto defense and Chini ya kilima are frequently fighting to take over and control mining sites. To get the source of revenue to purchase arms, ASGM cooperatives have become their first targets and paying the vast tribute ranging from illegal taxes, extortions to killings. Thus, ASGM sector is being cited as strategic dynamic that escalates and sustains conflict in Ituri region. For instance, 4 Chinese nationals and 2 FARDC soldiers were killed around Abombi mining sites by CODECO militias.

Another common type of conflict originated from land ownership between land owners, large scale concessions holders and surrounding artisanal miners. On May 8th 2022, 34 gold miners were killed in an attack by CODECO militias on camp Blanquette in kilo belt, Djugu territory as a result of fraudulent mining concession ownership on SOKIMO large scale perimeter.

5.7.2 Frequent landslide accidents

The frequent use of excavator machines, wide open hole digging and local made dredges machines have displaced many small rivers from their ordinary trajectories or bump (Appendix viii). As a result, the land is brutally altered around the mining sites causing unexpected accidents. So often, gold mining sites located along Ituri river like Yolo and independent in Mambasa gold belts faulting were being victims (Appendix xix).

The most frequent deadly ASGM accidents originate from mudslides and rock falls mostly in elluvial gold extractions sites where lack of expertise in underground operations provides less protection and safeguard to miners. The method is locally referred to "Sous-courant mode of gold extraction" (Appendix xii). As a matter of fact, two separates mudslides have occurred in Kilo belt leaving 4 gold miners dead in Imuse mining site on 21th April 2024, Kilo belt and 28 gold miners dead in Ndiyo mining site in Kibali belt.

5.7.3 Multiple Tax Burden hindering ASGM cooperatives activies

ASGM cooperatives are confronted with countless tax from different entities as pinned down out by tens of the total respondent outlook. The situation is so alarming according to the representatives of ASGM cooperatives. We witness so many workshops in the fields where sites managements are bargaining tax payment with various tax collection entities. From our findings, ASGM cooperatives members admitted clearly paying more taxes to central government than provincial and local government. In addition, they revealed that more than half percent of the payments claimed are illegal due to lack of transparency and double standard regulations. For instance, ASGM cooperatives are constant under military pressure when it comes to collecting tax levy.

Too many tax sources are put on them some legal and illegals especially from different militias groups such as CODECO, ZAIRE, MAPI, Auto defense and Chini ya kilima. As IMPACT 2020 points out in their annual reports the Democratic Republic of Congo's high taxes often pushed the price of gold beyond what the industry was willing to pay, creating a barrier to commercial viability (IMPACT 2020). As principle IMPACT 2020 has aimed to improve understanding of taxes and fees along the entire artisanal gold supply chain—from pit to export. Five workshops in Ituri Province and four in DRC's capital, Kinshasa,

brought together policymakers, officials from state services, artisanal miners, traders, exporters, and civil society to discuss the various taxes, fees, and administrative steps currently in place (IMPACT 2020).

5.7.4 Number of Foreign farm venturing illigally into the ASGM sector

Despite the strict recommendations of the Revised Mining Code 2018 (Law n°18/001) of March 09th 2018 chapter 27 from the Democratic Republic which prohibit foreigners to undertaking artisanal gold mining, our findings observed numerous expatriates like Chinese, Tanzanians, Ugandans, south Koreans (Appendix xvii) clustering on several sites. Thus, foreign nationals flocking into artisanal and small scale gold mining posed serious threats and frustrations to local ASGM cooperatives. According to findings sources, they tend to take over some of the viable mining sites from the local miners reason being they usually well equipped, funded and trained. Most of cooperatives representatives insisted on the phenomena piercing it out and recorded it as one of the root causes of many conflicts around the gold mining sites.

Thus, this field observation outcome was corroborated by Molly Miller (2022) in his book "Chinese's blue gold: Mining in DRC" whereas he reaffirmed: "Apart from Tshisekedi's obvious dissatisfaction with Chinese mining firms, many locals have become frustrated with the presence of Chinese mining companies. In Lualaba province, many depend on small-scale mining for their income. However, Chinese mining companies have struggled to effectively manage these artisanal miners, often ripping them away from their livelihoods (Molly Miller 2022).

5.7.5 Nonexistence of the modern gold refineries in the Ituri Province

Research findings also revealed the inexistence of the modern gold processing plant as one of the lead challenges confronted by gold mining cooperatives in maximizing profit. For the vast province such as Ituri, there is only one official gold sale counter called Muungano Na Maendeleo (MNM gold counter). And it definitely paves ways for the large quantity of gold produced in the region to end up being exported illegally in the neighbouring countries like Uganda, Kenya, and Rwanda.

According to IPIS report (2020), the DRC does not fully profit from the gold mining industry. IPIS estimated that between 75 and 98 percent of the Ituri gold crosses the border into Uganda illegally and from South kivu and Maniema ends up in Rwanda (IPIS report 2020). A vibrant testimony of a Ugandan gold dealer from Deutsche Welle radio investigation explains far and wide the saga: "When Congolese gold traders come here, they smuggle it," he says. But this isn't a hard problem to fix. "We buy the gold from them, put the documents in order, pay taxes to the Ugandan (Not DRC) government and export it to Dubai, China and the United Kingdom. So it becomes a legal export product with Uganda trade mark as the country of origin." DW report 2020 on Investigating Congo's illegal gold trade (DW report 2020).

Apart from a huge loss in tax revenue for the Democratic Republic of Congo, secret from our findings makes the matter worst by revealing that Congolese traders who smuggle gold into neighbouring countries do not benefit fully from the production, because after procession, they are paid the percent of pure gold only leaving out the other alloyed metal such as silver, copper, nickel and zinc. These deficiencies in authorized gold counters units and refineries need to be address and fix by the RDC authorities.

5.7.6 Absence of Government badgeted subsidies towards ASGM Cooperatives and provision of proper work materials

The lack of Government support and subsidies to ASM Cooperatives countrywide was quoted by a number of ASGM interviewers as one of the problems holding back their development and supports towards DRC economic growth. Neither the government nor its development partner’s financial supports are directed towards the ASGM sector up to date. Most of ASGM cooperatives heads believe their support can take many forms, going from financial aid, tax alleviations to the provision of proper work materials. Apart from the shortage in appropriate work materials to provide safety and protection challenging gold mining sector, ASGM cooperatives need intensive Funding, Trainings and Mentoring programs to develop the sector for better stake in Ituri development and economic growth.

5.8 Conclusion

As Hilson et al. (2021 a & b) quoted: “Artisanal and small-scale mining (ASM) has grown to become the most important non-farm source of rural income in sub-Saharan Africa and it’s become an important source of incomes, livelihoods and employment for millions”. Consequently, our research investigation into the impact of ASGM cooperatives of Ituri province into the country economic growth and social development sector revealed that their ASGM activities influenced positively and negatively environment plus its fauna and flora, the business and the lives of over 8 million people in Ituri Province. Besides, the fact that most ASGM members who were interviewed were employed in some secured gold mining sites leaving the area controlled by local militias may generate a clue to how multifaceted it may be to quantify the real figure of the employment rate in the province. Despite the hard work to grasp and quantify other socio-economic growth variables allover Ituri province, all the discussed factors throughout the study are much significant indicators to rate economic growth and development in Ituri Province in line with the general objective of the study.

Granting the fact that more men take part in various gold mining activities than women in over 445 mining sites across 5 gold belts in Ituri province (Kilo, Mambasa, Ngaya, Nzani and Panga), it was observed that all the ASGM cooperatives endeavoured first to supplement their family income and wellbeing. The need to find job and create own wealth in order to escape poverty explained the major reasons why new miners flock into gold mining sites enlightening the second specific objective of the study.

Moreover, the research findings depicted the positive contributions of ASGM cooperatives to the country economy were preponderant with economic indicators on number of people employed by its members, the living standards uplifted past the minimum 2.6 USD rate, some wealthiest earning beyond 10,000 USD annually, number of them as frontrunners among the businessmen in the province and best taxpayer to government revenue.

On a societal basis, the ASGM corporate social responsibility ingenuities were appreciated towards the community in terms of social infrastructure contributions such as church or school building and social events like sports and charities sponsorship in line with objective two. Subsequently to objective three, our research findings indicated that unemployment

and poverty rate among ASGM cooperatives members tends declined tremendously due to gold mining activity despite a number of challenges encountered in the sector.

Furthermore, there was a general wave of indifference among ASGM members and SAEMAPE about some of the drawbacks of the gold mining activities such as the environment concerns, proliferation of HIV and STDs, drugs and alcohol consumption, drop into education rate and destruction of livelihood farms as projected in the third specific objective of the this study.

The fact that some legal frameworks were set up through the Revised Mining Law, little had been done up to now to enforce them despite the presence of SAEMAPE as an organ of supervision and regulation of the sector and other government official and security all-over the mining sites. This further speeded up breeding grounds for a number of challenges to ASGM cooperatives in Ituri province that need to be appropriately addressed. Subsequent to such revelations, the Democratic Republic of Congo should reform its ASM policy requirements and laws to restructuring the sector to make more sustainable and lucrative in to contribute to socio-economic development all in perspective of meeting objective four of the study.

CHAPTER SIX
RECOMMENDATIONS

6.1 Introduction

This chapter presents a summary of recommendations from the study. It is assumed that they could most likely contribute to future drafting of mining laws and policies geared towards starching DRC's ASM sector, and in particular, ASGM cooperative as its sub segment. Hence, some underneath recommendations have been conscripted to underwrite following a number of challenges halting ASGM cooperative activities that result into its mere contributions to DRC social development and economic growth.

6.2 Recommendations

Based on the findings from the social and economic impact of ASGM cooperatives towards DRC's economic growth and development, some recommendations that were developed accordingly and the way forward included:

6.2.1 Urgent need to eradicate multiple armed groups and restore peace in the province

The first prerequisite of sustainable development and economic prosperity is definitely peace and security. Today, gold mining business has become a survival strategy for multiple militias groups in Ituri Province such as CODECO, ZAIRE, AUTODEFNCE, MAPI, CHINI YA KILIMA, CHINI LA TUNDA… Unfortunately, the huge price is being paid by ASGM cooperatives. The need to eradicate these armed groups should set as government priority number one because their principle targets conveyed into gold mining sites where they allegedly execute, torture and arbitrarily loot ASGM miners' properties as a consequence disrupt gold mining activities.

Despite, the "state of siege" an equivalent of martial decreed since may 4th 2021 to eradicate the militias group and the bilateral and regional forces have been deployed with UPDF partners to combat ADF, peace and security is far from being restore in eastern part of the Democratic Republic of Congo.

To pave way for ASGM cooperatives and other miners to freely exercise their gold mining activities in order to fully participate into the country development, DRC government should make an effort to deal deeply with these phenomena in order to build sustainable peace victor for good gold productivity.

6.2.2 Implementation of the Revised Mining Code 2018 (Law n°18/001) of March 09th 2018 and related regulations about the AM sector

As noted previously (Chapter 5), the main organ of the state in charge of compliance and regulation of DRC's ASM sector remains de facto SAEMAPE. Its primary duty must be focus on implementing the section of the Revised Mining Code 2018 (Law n°18/001) of March 09th 2018 and related regulations about the AM sector so that ASGM cooperates could know their rights and roles. If well mentored, they could exercise their gold mining activities according to the laws and regulation governing the ASM sector which can solve part of the problem.

This could range from equipping ASGM with legal tools to supporting them with enhanced technical knowledge and improved planning and coordination of activities. We also commend the regulatory body DRC ministry of mine to encourage the ASGM cooperatives to follow regulations for their own benefits, to knowing their rights and roles into developing the country.

As revealed in our findings (Chapter 5), ASM business are hindered by the presence of foreigners prohibited from engaging in ASM according to chapter 27 of Revised Mining Code 2018 (Law n°18/001) of March 09th 2018 which limit them to only large scale mining. Therefore, the government of the country should regulate the sector so that ASGM cooperatives can be protected and guided. If their rights and their interest prevailed in the sector it will probably enhance their contribution to the country development and economic growth.

6.2.3 Sensitization and mass awareness program about environmental protection in gold mining operations and misuse of mercury as well as cyanide

According to experts, environmental awareness signifies having an understanding of the subject insight and the impact of human behaviour on it and the importance of its

conservation and protection. Sensitising ASGM cooperatives in Ituri province to be aware about the environment destruction due to their gold mining operations that are destroying the environment from deforestation, farm land destruction to mass water pollution can make a big difference

As findings revealed (Chapter 5), most of gold processing exercises are done through mercury and cyanide. Given their emission into the environment with higher toxic nature negative effect on human health and biodiversity can cause more damage if not accurately addressed. This training and mentoring program should go from the danger surrounding the practice of chemical product such as mercury and cyanide use to appropriate safe techniques. Accordingly, the awareness program should put emphasis on the need to reduce the level of cyanide and mercury emission so that human health and the surrounding biodiversity could get protected.

Consequently, environmental safeguard awareness should be a priority during gold mining processes because damages are numbered thus the need of training ASGM cooperatives on the issue to fundamentally change their behaviour and attitudes towards protecting the fauna and flora for deforestation, damage and pollution. This will probably ensure sustainable gold mining that can fully support DRC socio-economic development and environment safety. And SAEMAPE should direct its actions towards regulating and monitoring ASM operations to ensure environmental protection and sustainability around the gold mining sites.

6.2.4 Training and mentoring program towards the risk and preventions for safe ASM mining, HIV and drug consumption

ASGM gold miner heath safety and security should be a priority. Thus, building ASGM cooperatives and other miners capacity on life protection seems very important because, mining sites are today turned into a center for prostitution, diseases and narcotics drugs consumption.

Beside, following a high rate of HIV and drug abuse amongst ASM gold miners, DRC ministry of health should set a special program to raise awareness and educate the gold miners to safe sex and zero drug abuse to help them to stay healthy in order to be more

productive and contribute to the country development. Facilities to counsel and mentoring gold miners should be provided as well. Hope, it will help to minimise the rising cases and retention.

And the researcher standpoint is of the view that appropriate training program about the above vices should be compulsory to every ASM gold member.

6.2.5 Building post-gold mining plan for ASGM community

From the field observations, findings revealed the inexistence plan for after mining operations both from the government and the ASGM cooperatives. It was observed that the gold miners are on repeated relocation from site to site leaving the unproductive sites and the community around mining to face the closure impact such as the adverse effect of environmental effects on the ecosystem and biodiversity, the loss of job, trade partners and other economic variables.

Hence, the government through its body SAEMAPE should set up the post gold mining planning policies to arrange for alternative sources of income in order to hold out employment, trade and development opportunities. So, incentives like providing access to funds for ASGM cooperatives and the local communities or coming up with development projects with donors' agencies and NGO in the abandon region could help to create more employment which can in return increase the resources and shape economic growth after the closure of gold mining sites.

6.2.6 Need to fund ASGM cooperatives and tax alleviation

Having noticed some of the economic contributions of ASGM sector in DRC throughout the research results (Chapter 4 and 5), this sector should capture the attention of both the government, development partners and NGO working in DRC to direct their funding supports towards their operations.

This valuable inducement could help in combating the source of illicit channels of financing for gold trade that are fueling the mining sites. Evidence showed that proceeds from money laundering by criminals or some state looters are disseminated in different gold mining sites in Ituri province,

For that reason, ASGM sector need a government special funding and direct investment to help the miners to strengthen their activities and avoid using the illegal source of finance. At the same time, initiatives to reduce tax burden that have been holding back ASGM cooperatives activities can be envisaged to set ways for tax alleviations for ASGM cooperatives. And the DRC development partners should join hands in supporting the sector with bilateral grants or aid.

6.2.7 Implantation of modern gold refineries and jewelry within Ituri province

From the field finding, we noticed the total absence of gold refinery plant in Ituri province. This has led to undervalue the precious metal from Ituri province of the decade by neighboring countries. DRC's government should set up a gold refinery plant within Ituri Province so that the refined gold could increase its value and boost its trade at market price with higher premium.

Finding result (Chap 5) indicated that traders smuggling the precious metal are only paid the percentage of Gold leaving other alloyed metals (Uganda case). So, the government has to capitalize the incentives for it will definitely give Ituri province the opportunity for to be known as producing the breakthrough components such as nickel, zinc and copper naturally alloyed in the gold metal which are only melded through refinery.

The presence of the gold refinery could lead to investment opportunity of gold jewelry industry and trade to be exported worldwide with its wide range economic contribution and development benefits for DRC Ituri province at large.

6.3 Further Reading

Given the dynamic of ASM operating gold mining in DRC Ituri Province, the researcher commends further studies on the ASGM cooperatives working in the region. Studies should be piloted to determine why, notwithstanding the intensive efforts in terms of legal instruments and regulations policies, the impact of their activities still linger the country economic development. The forthcoming studies will not only widen the facts on the subject matter, but also provide a practical approach forward.

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APPENDIX

Appendix i: Gold Map of Ituri Province covering ASGM sites

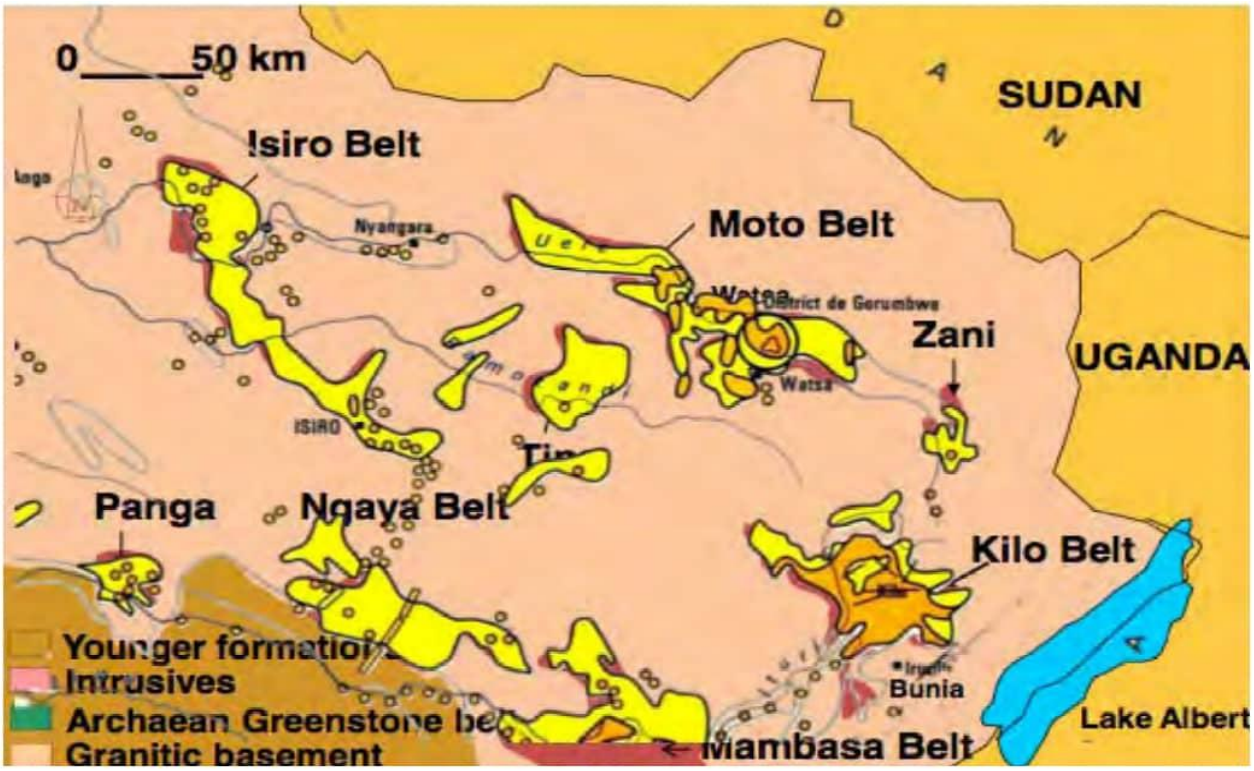

Figure ii source: Gold map in Province Orientale (Ituri and Haut-Uele Province mainly) adopted from SOKIMO archive 1970

Appendix ii: Work Plan

Activity	**Duration**	**Commencement**
Identification and preparation of the concept	Two weeks	30th September – 14th October 2023
Introduction of the proposal study	Three weeks	03th November – 24th November 2023
Literature Review	Three weeks	05th January – 25th January 2024
Proposed Research Methodology	Two weeks	15th February – 28th February 2024
Research questions & Supervision Approval	Four weeks	02nd March – 05th April 2024
Pre-site visit and preparation for the field	Two weeks	17th April - 30th April 2024
Data Collection	Four weeks	02nd May – 30th May 2024
Data Analysis and Editing	One week	01st June – 07th June 2024
Final Report Writing	Three weeks	08th June – 30th June 2024
Research Presentation, Submission and Miscellaneous	Three weeks	01st July 2010 – 18th July 2024
TOTAL		**Time frame = 27 weeks**

Appendix iii: Budget Estimation

S/No	Item	Quantity	Unit Cost $	Amount
01	- Papers - Pens - Pencils	 5 (Reams) 10	 5/= 0.2/=	 25 /= 2/=
02	Research Assistant	1(Person)	150/=	150/=
03	Travel expenses	Four territories	400/=	350/=
04	Secondary Data		100/=	100/=
05	- Binding - Photocopying - Printing	5(Copies) 5 (Copies) x Over 100 pages	5/= 50/= -	25/= 50/= 20/=
06	Miscellaneous		150/=	100/=
Grand Total				**822/=**

Appendix iv: Key Informants

No	Name	Institution
01	FURAHA CHUMA Bijoux	Director of SAEMAPE Ituri Province
02	BOSINGAKA TOTO	Head of Inspection service/SASMAPE-Ituri
03	ETOKWALA ETO	Head office in charge of Integrated Development Environment/ SASMAPE-Ituri
04	LONEMA MUKWA	President of federation of Enterprises/Ituri & President of COOMICO (Coopérative Minière de l'lturi «Ituri mining cooperative »)
05	BATCHU DJAKISA DAVID	President of COMOI (Coopérative Minière des Orpailleurs de l'lturi « Mining cooperative for Ituri gold miners »
06	Anonymous	President of COONORI (Coopérative des Négociants d'Or de l'Ituri « cooperative for Ituri gold traders »)
07	SOKO JEAN	President of COOPEMI (Coopérative des Exploitants Miniers Artisanaux de l'Ituri « Cooperative for artisanal miners of Ituri »
08	Anonymous	President of COOMISARA (Coopérative minière Saint-Raphaël « St Raphael mining cooperative
09	KABOSE JEAN	President of UMOJA GOLD (Coopérative minière UMOJA GOLD)
10	Anonymous	COOMINDEF (Coopérative Minière NDELE et Frères « Mining cooperative of NDELE and brothers »

Source: Research field's data

Appendix v: List of registered ASGM Cooperatives (With complete file in SAEMAPE Ituri office)

N°	SIGLE	FULL NAME	REGISTRATION / FILE	STATUS
01	COOMUBA	Coopérative Minière UREBA	Arrêté Ministériel N°0335/CAB/MlNES/01/2016 du 08 Aout 2016	-
02	Coopérative MALI YETU	Coopérative MALI YETU	Arrêté Ministériel N°0437/CAB/MlNES/01/2017	-
03	COMIDOR	Coopérative Minière de Développement des Orpailleurs	Arrêté Ministériel N°0322/CAB/MINES/O1/2016 du 08 Aout 2016	-
04	COOPEMI	Coopérative des Exploitants Miniers Artisanaux de l'Ituri	N°0336/CAB.MIN/ MINES/01/2016 du 05 Aout 2016	ACTIVE
05	COMIMAV	Coopérative Minière MOZINDO ADA VALERE	Arrêté Ministériel N°0328/CAB/MIN/01/2016 du 05 Aout 2016	ACTIVE
06	COMINI COOPCA	Coopérative Minière NILINGA	Arrêté Ministériel N°0329/CABMIN/MINES/01/2016 du 05 Aout 2016	-
07	COMOI	Coopérative Minière des Orpailleurs de l'lturi "COMOI"	Arrêté Ministériel N°330/CAB.MIN/MINES/01/2016 du 05 Aout 2016	ACTIVE
08	DYSMIC-COOP	La Dynamic Small Mining Cooperative	Arrêté Ministériel N°0364/CABMlN/MlNES/01/2016 du 05 Aout 2016	-
09	CO-MIDI	Coopérative Minière pour le Développement intégral "CO-MIDI/pas à pas"	Arrêté Ministériel N°0323/CABMIN/MINES/01/2016 du 05 Aout 2016	-
10	COMl COOP-CA	Coopérative Minière de l'Ituri	Arrêté Ministériel N°0335/CABMIN/MINES/01/2016 du 05 Aout 2016	-
11	COOMILUSO	Coopérative Minière la Lumière du soir	" Arrêté Ministériel N°0419/CABMIN/MINES/01/2016 du 09 Septembre 2016	-
12	COODEMI"	Coopérative Minière de l'Ituri	Arrêté Ministériel N°0320/CABMIN/MINES/01/2016 DU 05/08/2016	-
13	COOMICO	Coopérative Minière pour le Développement du	Arrêté Ministériel N°0321/CAB.MIN/MINES/01/2016 du 05 Aout 2016	ACTIVE

		Congo		
14	"CO-MIDI/pas à pas"	Coopérative Minière pour le Développement intégral "CO-MIDI/pas à pas"	Agréée	ACTIVE
15	CMC	Coopérative Minière pour les Congolais "CMC"	Arrêté Ministériel N°0254/CABMIN/MINES/01/2016 du 30 Mai 2016	-
16	COOMIDEV	Coopérative Minière pour le Développement de l'ITURI	Arrêté Ministériel N°0623/CABMIN/MINES/01/2017 17du14 Octobre 2017	-
17	COMIDEVI	"COMIDEVI-TUJENGE"	Arrêté Ministériel N°0642/CABMIN/MINES/01/2016 du 30 Mai 2017	-
18	COOMINDEF	Coopérative Minière NDELE et Frères "COOMINDEF"	Arrêté Ministériel N°063/CABMIN/MINES/01/2017 du 14 Octobre 2016	ACTIVE
19	COOPKIMISI	Coopérative Minière KIZA Mines SINDADI "COOPKIMISI" "COOPKIMISI"	Arrêté Ministériel N°0634/CABMIN/MINES/01/2017 du 14 Oc-tobre 2017	-
20	ADC	Coopérative Minière Action pour le Développement Communautaire "ADC'	Arrêté Ministériel N°0629/CABMIN/MlNES/01/2016 du 14 Oc-tobre 2017	-
21	COOMISARA	Coopérative Minière Saint Raphael "COOMlSARA"	Arrêté Ministériel N°0632/CABMIN/MlNES/01/2017 du 14 Oc-tobre 2017	ACTIVE
22	COOMITEBA	Coopérative Minière TEMBEYA Na BWANA "COO-MITEBWA"	Arrêté Ministériel N°0633/CABMlN/MlNES/01/2017 du 14 Oc-tobre 2017	-
23	COMIDES	Coopérative Minière pour le développement Social "CO-MIDES"	Arrêté Ministériel N°0630/CABMlN/MINES/01/2016 du 14 Oc-tobre 2017	-
24	MALI-YETUSCOOPS	Société Coopérative Minière Simplifiée MALI-YETU	Arrêté Ministériel N°0437/CABMIN/MINES/01/2017 du12 septembre 2017	-

		"MALI-YETUSCOOPS"		
25	COPERAME/CA	Coopérative Minière de MUNGBWALU et ses Environs avec conseil d'Administration "COPERAME/CA"	Arrêté Ministériel N°0754/CAB.MIN/MINES/01/2016 du 24 oc-tobre 2016	ACTIVE
26	IDJO	Initiative d'Encadrement de la Jeunesse pour le Développement "I.D.J.O"	Arrêté Ministériel N°0771/CAB.MIN/MINFS/01/2016 du 24 Oc-tobre 2016	-
27	COOMIBE	Coopérative Minière de BERUNDA "COOMIBE"	Arrêté Ministériel N°0251/CAB.MIN/MINFS/01/2016 du 10 mai 2016	-
28	COMEABRIEM	Coopérative des Exploitants Artisanaux dans les bassins des rivières ITURI/ANDISA	Arrêté Ministériel N°0643/CAB.MIN/MINFS/01/2017 du 15 Oc-tobre 2017	-
29	COMICO	Coopératives Minière du Congo	Arrêté Ministériel N°0329/CAB/MlNES/01/2016	-
30	CODEMA	Coopérative Minière de Développement des exploitants Miniers Artisanaux de MAMBASA "CODEMA"	Arrêté Ministériel N°0324/CABMIN/MINES/01/2016 du 10 mai 2016	-
31	COOMITURI	Coopérative Minière de l'Ituri "COOMITURI"	Arrêté Ministériel Ministériel N°0332/CABMIN/MINES/01/2016 du 05 Août 2016	ACTIVE
32	COMIPEDE	Coopérative Minière du peuple pour le Développement	Arrêté Ministériel N°0339/CAB.MIN/MINES/01/2016 du 05 août2016	-
33	COMEAD	Coopérative Minière des Exploitants Artisanaux pour le Développement "COMEAD"	Agréée	-
34	COOPEMO	Coopérative Minière Oracle "COOPEMO"	Arrêté Ministériel N°0843/CA.BMIN/MINES/01/2015 du 02 Oc-tobre 2015	-

35	CMNC	Coopérative Minière Ngayo Congo "CMNC"	Arrêté Ministère N°0821/CAB.MIN/MINES/01/2016 du 11 novembre 2016	-
36	NDO-OKEBO "SOCOMIN-DOK	Société Coopérative Minière de NDO-OKEBO "SOCOMIN-DOK"	Arrêté Ministériel N°0092/CABMIN/MINES/01/2016 du 29 Avril 2016	ACTIVE
37	COOMIC	Coopérative Minière du Congo "COOMIC"	Arrêté Ministériel N°0791/CAB.MIN/MINES/01/2016	-
38	COOP-UMOJA	Coopérative Minière "UMOJA'' de l'Ituri	Agréée	ACTIVE
39	COONORI	Coopérative des Négociants d'Or de l'Ituri "COONORI"	Arrêté Ministériel N°0102/CAB.MIN/MINES/01/2016 du 04 mai 2016	ACTIVE
40	CKOKP	Coopérative Minière KONJI OBI KOSI KPANGA "CKOKP"	Arrêté Ministériel N°0338/CABMlN/MlNES/01/2016 du 05 Aout 2016	-
41	SOMICO	Solidaire des Mines en Coopérative "SOMICO"	Arrêté Ministériel N°0337/CAB.MIN/M Ministériel N°0337/CAB.MIN/MINES/01/2016 du 05 Aout 2016	-
42	COCAMINES	Coopérative Minière des Carrières et Mines COCAMINES	Arrêté Ministériel N°0333/CAB.MIN/MINES/01/2016 du 05 Aout 2016	-
43	COOMITUK	Coopérative Minière TUUNGANEKWA KUJENGA	Arrêté Ministériel N°0325/CAB.MIN/MINES/01/2016 du 05 Août2016	-
44	COODEMI	97 Coopérative de Développement Minier de l'Ituri "COODEMI"	Arrêté Ministériel N°0320/CAB.MIN/MINES/01/2016 du 05 Aout 2016	ACTIVE
45	COOEMACO	Coopérative Minière des Exploitants des Matériaux de Construction "COOEMACO"	Arrêté Ministériel N°0331/CAB.MIN/MINES/01/2016 du 05 mai 2016	ACTIVE
46	COOMIKI	Coopérative Minière KINAMA "COOMIKI"	Arrêté Ministériel N°0334/CAB.MIN/MINES/01/2016 du 05 août 2016	-

47	ABAACO	Coopérative Minière Alliance des BALESE et Associes en Coopérative "ABAACO"	Arrêté Ministériel N°0327/CAB.MIN/MINES/01/2016 du 05 août 2016	-
48	COOMl.KSK	Coopérative Minière KASEREKA SIKWA et associés "COOMl.KSK"	Arrêté Ministiriel N°0326/CAB.MIN/MINES/01/2016 du 05 août 2016	-
49	COOMEA	Coopérative Minière des exploitants artisanaux "COOMEA"	Arrêté Ministériel N°0281/CAB MIN/MINES/01/2017 du 28 Août 2017	ACTIVE
50	COMUDECO	Coopérative Minière de l'unité pour le développement communautaire "COMUDECO"	Arrêté Ministériel N°0152/CAB MIN/MINES/01/2017 du 03 Août 2017	-

Source: SAEMAPE ITURI

Appendix vi: Gold filtering process through cyanide thank in Magbo, Kilo belt Djugu Territory

Source: Research field's data

Appendix vii: The researcher assisting a lady in the process of gold filtering in Nizi, Kilo belt, Djugu territory

Source: Research field's data

Appendix viii: The researcher on a polluated shari river in Irumu territory

Source: Research field's data

Appendix ix: Cocoa plantation turned into mining sites in Russie site, Mambasa belt and territory

Source: Research field's data

Appendix x: Beginning of cyanide installation in Pk 45, Panga belt (Mambasa territory)

Source: Research field's data

Appendix xi: The researcher inspecting and interacting with a manual stone crusher miner in Kolwezi, Nzani belt (Mahagi territory)

Source: Research field's data

Appendix xii: Underground hope for eluvial gold extraction in Pluto, Kilo belt (Djugu territory)

Source: Research field's data

Appendix xiii: Landslide in Pk 51 canon site, panga belt (Mambasa territory)

Source: Research field's data

Appendix xiv: The researcher on landslide at independent site , Mambasa belt (Mambasa territory)

Source: Research field's data

Appendix xv: Mudslide in Ngaya belt Mushasha site, Mambasa belt (Mambasa territory)

Source: Research field's data

Appendix xvi: The reseacher in a stone crusher machine workshop , Igasite, Kilo belt (Djugu territory)

Source: Research field's data

Appendix xvii: Chinese company for alluvial gold extraction, Mabanga site, Kilo belt (Djugu territory)

Source: Research field's data

Appendix xviii: Ladies drying powder before filtering process in Lodjo, Kilo belt (Djugu territory)

Source: Research field's data

Appendix xix: An abandoned landslide that left 2 people dead in Russie site , Mambasa belt (Mambasa territory)

Source: Research field's data

Appendix xx: Deforestation for gold mining site at Yolo site, Mambasa belt (Mambasa territory)

Source: Research field's data

Appendix xxi: Ituri province in DRC adiminstrative map

Source: Downloaded from radiookapi.net (Internet)

Research Questionnaire

UGANDA CHRISTIAN UNIVERSITY

A Centre of Excellence in the Heart of Africa

RESEARCH QUESTIONNAIRE

Dear respondent,

These questionnaires are designed to collect information on the social and economic contributions of the artisanal and small scale gold mining in Ituri Province in the Democratic Republic of Congo (DRC), in accordance with the requirement for the award of Master degree in Business Administration at the Uganda Christian University (UCU) in the Republic of Uganda.

Please complete the form by either filling in blank spaces or putting a tick in the appropriate section. All information you give shall be treated in the strictest confidence.

Your inputs and insights are greatly acknowledged in anticipation.

Yours, faithfully

ALIANG'O THUMITHO Alphonse: +243 97 81 77 450

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Section A: Demographic attributes

01) Gender profile: Male ☐
Female ☐

02) Age group profile: Between 18 - 30 ☐
Between 30 - 45 ☐
Between 45 - 60 ☐
Older than 60 ☐

03) Profession affiliation: Member of ASGM Cooperative ☐ Yes
☐ Non

Other (Please specify)……

04) Length of experience in the artisanal and small scale gold mining or any other related business:

Between 1…5 years ☐
Between 6…10 years ☐
Between 11…15 years ☐
More than 15 years ☐

Section B: Knowledge questions

1. **Semi-structured interview for ASGM Cooperative member or associate work location**

S/No	Questions directed to assess artisanal and small scale gold miners respondents identity	Response
01	Name you ASGM cooperative	
02	Where is your artisanal gold mining located and number of coworkers?	
03	What are you really doing in ASGM activities?	
04	What was your previous job activity?	
05	For which reason did you join the ASGM activity?	

2. **Semi-structured Interview for ASGM Cooperative member or associate achievement**

S/No	Questions directed to gauge artisanal and small scale gold miners respondents achievements	Response				
		S.DAG	DISAG	N	AGR	S.AGR
01	Do you have ASGM cooperatives membership card?					
02	Did you manage to make some decent achievements as results of your gold mining job?					
03	Did your gold mining activities help you to buy and own a plot?					
04	Any asset acquired (cash, house, cars, bank balance…) as a result of gold mining activities?					
05	Did you manage to create or set any business unit					

	as a result of gold mining activities?					
06	Are there some people employed directly by you or your set business as result of gold mining activity?					
07	Could you broadly estimate your annual earnings from gold mining business?(Monetary terms greater, equal or less than 10,000$)					

3. Semi-structured Interview for ASGM Cooperative community welfare intervention

S/No	Questions directed to measure artisanal and small scale gold miners community welfare involvement	Response				
		S.DAG	DISAG	N	AGR	S.AGR
01	How many dependents survive from your gold mining activity (Health and feeding, state the number: greater, equal or less than 3)					
02	Could you broadly estimate your daily spending and your family? Any improvement on your family living standards (Monetary terms greater, equal or less than 3 $)					
03	How many children do you support for education (specified primary, secondary or university specify the number: greater, equal or less than 5)					
04	Any other support intervention like sport club, church, charity gift, orphan home…					

4. Semi-structured Interview for ASGM Cooperative legal payment obligation

S/No	Artisanal and small scale gold miners level of tax payment	Response				
		S.DAG	DISAG	N	AGR	S.AGR
01	Do you honor your tax obligation					
02	From the diverse tax paid last year, your contributions to national government coffers were they greater than the provincial?					
03	Do you pay any contribution to local leaders and baraza la wazee?					

04	Do you reimburse any other payment to your cooperative					
05	Any other unlawful tax charge					

5. Semi-structured interview for ASGM self-assessment

S/No	Artisanal and small scale gold miners level of satisfaction	Response				
		S.DAG	DISAG	N	AGR	S.AGR
01	How do you rate your achievements as gold miner (very high, high, normal, low and very low)					
02	Are you willing to continue to work in the same sector?					
03	How do you measure your effort to contribute as ASGM cooperatives to the country economic growth (very high, high, normal, low and very low)					
04	How do you rate your effort to contribute as ASGM cooperatives to the social development (very high, high, normal, low and very low)					
05	How do you evaluate the government efforts towards restoring peace and security in the mining sites? (very high, high, normal, low and very low)					

NB: S. DIS: strongly disagree, DISAG: disagree, N: neutral neither disagree nor agree, AGR: agree and S.AGR: strongly agree.

6. What was the main reasons you to joining ASGM cooperatives?

1.Wealth creation	2.Formal job scarcity	3.Poverty	4.School dropout	5.Legal proceeding or others reasons

7. What are some of the downsides of the gold mining activities affecting the regions?

1.Environmental concerns	2.Proliferation of HIV and	3.Drug and alcohol	4.Destruction if firm	5.Reduction in education and

	STDs	abuse	livelihoods	others factors

8. **Which challenges do you face as gold miner or cooperative in the artisanal and small scale mining sector?**

1.Insecurity	2.Land slide resulting into death and injury	3.Inexixtence of gold refinery plant	4.Tax burden	5.Lack of government support or others

THANK YOU FOR YOUR TIME AND EFFORT, YOUR PARTICIPATION WILL INFLUENCE THE OUTCOME OF THIS STUDY