

# Master's Thesis

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An Exploration of Residents' Perception of Gold Mining  
in Nkwanta Community in Ghana.

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## ABSTRACT

This study explores the perception of gold mining among the residents of the Nkwanta community in Ghana. This study employed a mixed methods approach with the use of relative importance index, logistic regression, and thematic analysis of open-ended responses to explore the research problem. The findings reveal an intricate perception of gold mining within the Nkwanta community. While the economic benefits of mining, such as employment and infrastructure development, were recognized, they were ranked lower in importance of the public health consequences of mining activities which were viewed as the most severe impact. The finding suggests that education shapes worldviews and value systems, with the least educated prioritizing immediate livelihood needs and the highly educated emphasizing long-term, non-visible consequences like environmental and cultural preservation. Additionally, the study found that higher annual incomes were associated with increased opposition to mining. In terms of proposed measures to improve the mining sector, the community emphasized four key priorities: strengthening regulations and enforcement, enhancing participatory processes in decision-making and oversight, supporting the formalization and training of small-scale miners, and requiring comprehensive impact planning through environmental assessments, reclamation plans, and closure plans.

**Keywords:** Gold mining, community perception, public health, environmental impact, livelihood disruption, small-scale mining.

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**DECLARATION**

I hereby declare that this project is the result of my own research and no part of it has been presented for another diploma in this university or elsewhere.

Candidate's Signature ..... Date.....

Name : James Suglo.

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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the study

Ghana has a lengthy history of gold mining, producing a significant amount of the world's gold over the years (Hilson, 2002a). The country was known as the Gold Coast Colony during the colonial British administration, and gold mining was booming. The first gold rush took place between 1892 and 1901, with the second following World War I. Gold production fell sharply when the country gained independence in 1957 and remained stagnant until the 1980s. Ghana has been during its third gold rush in the last 20 years. The sector is highly capital intensive, and direct employment generation is modest in comparison to its economic importance (Chuhan-Pole, Dabalén, Kotsadam, Sanoh, Benschaul-Tolonen & Tolonen, 2015). Despite accounting for 5.5 percent of GDP, around 20,000 Ghanaians (0.08% of the population) were anticipated to be employed in large-scale mining in 2010 (Yager, 2010). However, because nonnationals also work in the mines and pay is quite high, spillovers to other sectors of the economy may be significant.

According to Aryee (2001), large-scale mining contributed more than \$300 million to the national economy in salaries alone between 1986 and 1998. The mining sector has been a major driver of foreign direct investment in Ghana (Anyanwu & Yameogo, 2015; Nylandsted, Yankson & Fold, 2009). In the 1990s and 2000s, hundreds of millions of dollars were invested in developing new mines and expanding existing operations. This foreign capital helped develop infrastructure like roads, rail, power stations and ports that benefit other sectors of the economy. The mining sector consumes large amounts of fuel, equipment, explosives and other goods and services. This generates economic multiplier effects as mining companies source these inputs locally where possible. Local sourcing and procurement policies have aimed to maximize these linkages. There

is also evidence that the mining sector crowds in additional foreign direct investment in other export-oriented sectors (Anyanwu & Yameogo, 2015).

Ghana obtains a significant amount of its foreign cash from gold exports, and gold exports contribute significantly to the GDP (Aryee, 2001). According to Aryee (2001), by the end of the 1990s, foreign direct investment in Ghana's mining sector had surpassed \$3 billion, resulting in the industry accounting for over a third (30%) of gross foreign exchange revenues. Equally, Akabzaa and Darimani (2001) assert that the official recorded output of newly mined gold in 1997 was over 54 metric tons, valued at around US\$545 million. The number of mining corporations that have 'trooped' into Ghana since the 1990s is proof of this. In Ghana, there are sixteen main and minor gold mining businesses, most of which are in the Wassa West District, Goldfields Ghana Limited, Prestea Sankofa Gold Limited, Bogoso Gold Limited, Abosso Goldfields Limited, AngloGold Ashanti, and New Century Mines are a few of these companies. Currently, all these enterprises use surface mining as a method of operation (Akabzaa and Darimani, 2001).

The mining industry is linked to the wider economy through taxes and royalties, in addition to direct and indirect employment consequences. Ghana has been cited as an example of how mineral-rich countries might divide mining income by distributing a percentage of the rents to local populations (Standing & Hilson, 2013). Mining royalties in Ghana were 3 percent until 2010, which was the average rate for gold output in Africa (Chuhan-Pole et. al., 2015), but were raised to 5% in 2010 (Standing & Hilson, 2013). Eighty percent of the money goes to the general government budget, ten percent to mining supervision administration, and ten percent to district administration (Garvin, McGee, Smoyer-Tomic & Aubynn, 2009). Approximately US\$17 million was provided to local mining communities between 1993 and 1998 (Aryee 2001).

The distribution of mining rents and royalties to local communities has had mixed results. While it is regarded as a model of best practice, there is still concern that the district distribution's favorable impacts are harmed by elite capture and corruption at the district level (Standing & Hilson, 2013). Standing & Hilson (2013) argue that this model provides much needed development funds to remote and marginalized areas that host mines. The funds have been used to build schools, clinics, roads, water systems and other infrastructure. This helps compensate local communities for the environmental and social impacts of mining operations. However, management of the mineral development funds at the district level has been plagued by misuse and corruption in some cases. The chief and elders may capture the rents rather than spending it on projects to benefit the broader community. There are also coordination failures between mining companies, local government and communities in terms of aligning corporate social responsibility programs with local development plans. The scheme suggests that, in addition to the more local-level analyses, a district-level study may be required for investigation of the perception of communities on gold mining.

On the other hand, other scholars find that the mining sector is thought to have been a “resource curse” to many countries on the continent, as these countries are rich in mineral resources but remain poor, fully displaying “paradox of plenty” problems (Collier, 2008). Regardless of its affluence in natural resources, Africa remains entangled in poverty with hundreds of millions of its people struggling to meet their needs. In many countries, natural resources have also been at the center of instability as causes and economies of civil wars, as in the cases of the Democratic Republic of Congo and Sierra Leone (Collier, 2008; Rustad, Østby & Nordås, 2016). While the term "resource curse" is primarily associated with large-scale industrial mining, the economic stakes associated with the extraction of mineral resources can result in conflicts and violence

between miners and landowners. Mineral resource governance is at the center of problems for state governance in resource-rich countries in Sub-Saharan Africa because of these circumstances (Salifu, Oladejo & Adetunde, 2013).

With dwindling opportunities for community development in mining areas, the story has altered. Massive forest clearing and land degradation have resulted in major social and environmental concerns in mining villages because of the mining boom. Improper waste disposal, mineral processing, and mining chemical misuse result in a decrease in safe drinking water for humans, a decrease in air quality, a decrease in biological biodiversity, a decrease in forest cover, and a decrease in livelihoods (Campbell, 2004). In support of this Samuel, Oladejo, and Adetunde (2012) claims that the extraction of these resources has been fraught with difficulties because precautions were not taken to prevent the depletion of other resources.

In general, the mining industry has been a significant source of employment, particularly in places where it is carried out. It provides people with a significant additional source of income and serves as a significant additional source of employment (Hilson, 2002). It has also aided the formation of related businesses and industries, such as security and catering companies, laboratories, and equipment leasing and sales companies. In Ghana, the sector employed approximately 20% of the official workforce in 1995. Large scale mining businesses employ only 20,000 people, but the small-scale sector, which includes illegal mining, employs almost 200,000 people (Hilson et al., 2007; Antwi-Boasiako, 2003). For a variety of reasons, Africa's unique mineral resources have long piqued the interest of governance actors, nongovernmental organizations, academics, multinational companies (MNCs), rebel groups, and individuals (d'Avignon, 2018; Hilson et al., 2017; Siegel & Veiga, 2009).

However, Africa's extractive industry is divisive. On the one hand, it is a key economic driver that generates enormous financial gains for both governments and citizens. On the other hand, mining activities are associated with devastating effects on the environment which far outweigh the benefits. Masindi and Muedi (2018) advance that the environmental legacy of mining in many African countries is bleak. Water and air pollution from mining operations has contaminated critical resources needed by local communities. Mine waste dumping, dam collapses and erosion have degraded farmlands and forests. Acid mine drainage from abandoned mines continues to pollute water bodies long after closures. Consequently, rehabilitation efforts by mining companies have often been insufficient as Ayee et al (2011) opines that stricter environmental regulations and enforcement are needed, however capacity constraints in government oversight bodies hamper monitoring and compliance. There is also a history of mining companies evading responsibility for proper closure and remediation when reserves are depleted.

## **1.2 Problem Statement**

Mineral wealth is an essential source and asset that helps to drive an economy's growth, which may be measured in terms of increased GDP, infrastructural development such as roads, and water supplies, among other things. Ghana is Africa's second-largest gold producer, trailing only South Africa. Ghana has a plethora of gold mining operations throughout the length and breadth of the country in communities such as Nkwanta, Tarkwa, Damang, Bogoso, and Prestea-Huni Valley and this has attracted several Gold Mining Companies to these communities and other nearby towns and villages with the sole purpose of carrying out mining operations. The Nkwanta district is one of the most heavily mined communities and has gained notoriety because of the existence of both major and small-scale gold mining businesses. The gold mining activities in the community are expected to translate into human, capital and infrastructural development.

Together, these contribute to the socio-economic progress and prosperity of the community and its residents.

However, the reality on the ground is very different from expectations as the level of development in the community is far from what is expected (Agbesinyale, 2007). There is a growing body of research that examines the extent to which mining activities deliver socioeconomic benefits to local communities (Chuhan-Pole et al., 2017; Hira & Busumtwi-Sam, 2018). The common position is that proximity to mining operations does not automatically translate into improved development outcomes for residents. Several factors may inhibit positive spillovers including lack of local procurement by mining companies, use of expatriate and non-local labor, environmental damage that undermine livelihoods, and mining revenue mismanagement by local authorities. More robust impact evaluation is needed to identify conditions under which mining activities catalyze broad-based development versus primarily benefiting elites and outside interests.

Most people in mining communities continue to live in abject poverty explained by the destruction of the arable farmlands and vegetation, pollution of the community's source of drinking water, noise pollution among others. Thus, gold mining is increasingly being viewed as a threat to livelihood and, eventually, survival of the people in these communities. These negative effects of the gold mining operations highlight the environmental and social costs of mining. Recent discussions of gold mining and its implications have shifted from a focus on the mine's many benefits to a focus on the environmental and social costs (Darimani, Akabzaa & Attuquayefio, 2013). This has prompted several human rights organizations, both national and international, to highlight the problem of unsustainable mining and its effects on host communities.

These groups are essentially acting as watchdogs for gold mining operations, ensuring that negative externalities on host communities are kept to a minimum. However, the voice of mining-affected communities is often marginalized in policy discussions and negotiations with companies. Emel and Huber (2008) note that globalization has enabled transnational mining companies to gain greater leverage over governments in developing countries, allowing them to shape legal frameworks and contract terms in their favor. The community-company grievance mechanisms frequently lack independence and impartiality. Though civil society advocacy has helped give prominence to human rights issues surrounding mining there are limits in substituting for empowering community agency and self-advocacy (Szablowski, 2007).

There is debate around the appropriate analytical frameworks for assessing the community impacts of mining. Existing studies on gold mining have largely focused on the environmental costs of mining with little attention to the socio-economic costs (Hilson, 2002b; Donkor, Nartey, Bonzongo & Adotey, 2006; Tenkorang & Osei-Kufuor; 2013). These studies using the “resource curse” lens have highlighted the negative effects of gold mining on their respective case communities. This research aims at exploring a multi-dimensional perspective on the complex relationships between mining and its impact on the immediate community by unravelling the reality of gold mining activities to the people of Nkwanta. This will involve highlighting both the positive and negative effects of gold mining on the lives of residents of Nkwanta. Thus, the purpose of this study is to explore the effects of gold mining in Nkwanta, thus establishing the gold mining as a curse or blessing to the people.

### **1.3 Research Objectives**

This research seeks to achieve the following objectives:

1. To explore the perception of gold mining among the people of Nkwanta.



2. To establish the demographic factors influencing opposition of mining practices in Nkwanta.
3. To study measures that could be used to improve the mining sector in Nkwanta.

#### **1.4 Research Question**

This research seeks to answer the following questions:

1. How do the people of Nkwanta perceive gold mining?
2. To what extent do the demographic factors of the residents of Nkwanta influence opposition to mining practices in Nkwanta?
3. In what ways can the mining sector in Nkwanta be improved?

#### **1.5 Significance of the study**

This study makes significant contributions to empirical literature and policy directives. Firstly, it enriches the existing body of literature on gold mining in Ghana, particularly focusing on the case of Nkwanta. While previous studies have provided valuable insights, they predominantly centered on the environmental costs associated with gold mining activities. However, this study aims to bridge this gap by adopting a comprehensive approach that examines not only the environmental impacts but also the socioeconomic benefits and costs experienced by the people of Nkwanta due to gold mining. This study acknowledges that while gold mining may bring about economic opportunities and infrastructural development, it can also lead to social disruptions, health hazards, and environmental degradation. Thus, this study seeks to provide a holistic perspective that captures the complex dynamics at play within the community affected by gold mining activities.

Secondly, the paper also contributes to defining policy directives. The findings of the study will provide national and local policymakers, as well as development partners with valuable insight into the effects of gold mining in the Nkwanta community. This study comes at an important

junction as the Ghanaian government reviews mining laws and contracts to increase benefits retained within the country. This is because understanding community perspectives will help ensure new frameworks address local priorities and implementation challenges on the ground. The finding of the study on the impacts of mining on youth and vulnerable groups can inform targeted policy and programming. Thus, assessing drivers of conflict and cooperation between companies and residents will highlight areas for improving stakeholder engagement.

Equally, the findings of the study will inform the policymakers of how gold mining is perceived in the community as well as the challenges to the industry. The study results can guide reforms in several policy domains including local content, resettlement, corporate social responsibility, environmental protection, artisanal mining regulation, and community development agreements. This is because by spotlighting what has worked well versus poorly in Nkwanta, lessons can inform drafting of enhanced legal provisions, model contracts, guidelines and impact assessment tools to raise standards across the sector. Consequently, the findings will aid policymakers in identifying priority areas for technical assistance to build government and community capacity. Also, the study recommendations can shape initiatives to formalize and improve sustainability of artisanal mining.

Finally, the result of the study is expected to translate into the development of research-informed policies to define policies to address the growing costs of illegal gold mining in Ghana. The result of this study will assist policymakers in devising a balanced approach that addresses challenges associated with unauthorized mining while also recognizing its livelihood importance for many rural dwellers. A key aim should be transitioning artisanal miners into regulated small-scale mining enterprises with proper health, safety and environmental protections. The formalization requires reducing bureaucratic hurdles for small mining licensing and financing

while strengthening extension support, vocational training, and access to more efficient and less harmful technologies. Thus, the study findings can inform targeted alternative livelihood programs and economic empowerment initiatives for high-risk demographics drawn into illegal mining. The results will also guide communication campaigns to shape public attitudes and build consensus for policy reforms.

### **1.6 Organization of the study**

The research comprises five chapters, each serving a distinct purpose in the exploration of the research topic. The first chapter provides a comprehensive overview of the research topic, research question and highlighting its significance. The second chapter dedicated to a thorough examination of existing literature synthesizes key findings from relevant scholarly works. The third chapter focuses on the research methodology, detailing the methods and techniques employed for data collection and analysis. It provides a clear explanation of the research design, data collection procedures and the techniques for data analysis. In chapter 4, the findings of the research are presented, interpreted, and discussed in relation to existing literature. Finally, the concluding chapter serves as the culmination of the research. It details the synthesizes the key findings of the study, reiterating their significance and implications. Practical recommendations are offered, suggesting avenues for future research and potential strategies for addressing identified issues.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This chapter reviews relevant literature in understanding how gold mining is perceived in mining communities. The chapter begins by defining the term gold mining, highlighting gold mining in Ghana and discussing the theoretical framework that is used to explain this concept in the study. It then delves into existing literature on how communities perceive gold mining. The chapter also describes the conceptual framework that is used in the study and concludes by summarizing the research gap that the study seeks to address.

#### **2.1 Definition of Gold Mining and its types**

Generally, the definition of gold mining in existing literature highlights specific themes focusing on economic benefits, cultural significance, and environmental and social impacts. Verbrugge and Geenen (2019) define gold mining as the extraction of gold from the earth normally taking place from subterranean deposits utilizing methods like open-pit mining, underground mining, or placer mining. Bebbington et al (2008) presents a similar definition extending that gold mining is a lucrative industry that has played a significant role in the development of many countries, particularly in the global south. Equally, Hilson (2002) defines gold mining as the extraction of gold from the earth's crust and has played a significant role in human history, both as a symbol of wealth and power and as a source of economic development. Hilson (2012) contends that despite the potential for economic development, the environmental and social impacts of gold mining are significant and can be long-lasting, particularly in developing countries.

The highlighted definition of gold mining has some potential shortcomings regarding the lack of attention to the specific social and environmental risks associated with gold mining, and

the potential for framing gold mining as either positive or negative without fully considering its complexities and trade-offs. Thus, in reaction, this study defines gold mining as the practice of extracting gold from the earth's crust using various techniques, tools, and chemicals. It is a significant industry worldwide, with economic, social, and environmental impacts. While it provides economic benefits and can bring significant revenues to communities and countries, it is also associated with significant environmental and social risks, such as habitat destruction, pollution, and conflicts with local communities.

Existing literature has dichotomized the forms of gold mining into large scale mining and artisanal small-scaled mining (Hilson, 2002; 2003). Large-scale mining (LSM) is a type of industrial mining that involves advanced technology, significant capital investment, and the extraction of minerals on a large scale. LSM typically involves large-scale operations, sophisticated equipment, and high production rates (Hilson, 2002). LSM is an important industry worldwide, with many countries relying on mining as a key source of economic growth and development. For example, the mining sector is a major contributor to the economies of many African countries, including South Africa, Ghana, and Tanzania. In Ghana, gold mining accounts for approximately 5% of the country's GDP and 35% of its total export earnings (Gajigo, Mutambatsere & Mdiaye, 2012).

On the other hand, artisanal and small-scale mining (ASM) refers to informal mining activities that are typically carried out using basic equipment and technology, and with minimal capital investment. ASM is often characterized by small-scale operations, informal work arrangements, and low levels of mechanization (Hilson, 2003). ASM frequently involves rudimentary techniques like panning and sluicing, which are less efficient and capture only a fraction of the gold. ASM is a significant source of livelihood for millions of people in developing

countries, particularly in sub-Saharan Africa, South America, and Asia (Hilson & Maconachie, 2020). ASM provides employment opportunities for individuals who may not have formal education or training, and often operates in areas where other economic opportunities are limited.

The acceptance of LSM and ASM activities differs in gold mining communities (Hentschel, Hruschka, & Priester, 2002). LSM operations often require large areas of land, leading to loss of agricultural land and access to forest resources. In contrast, ASM takes place on smaller plots with less intensive land impacts and provides accessible livelihoods for locals. However, communities still face disruption from environmental damage, social issues, and conflict over ASM access rights. The co-existence of LSM and ASM on concessions remains a challenge. The socioeconomic impacts of LSM versus ASM can vary at national and local levels (Orozco & Veiga, 2018). At the national level, LSM contributes substantially more to GDP, government revenue, exports, and large-scale job creation. At the local level, ASM provides more dispersed livelihood benefits and circulation of income in communities. However, the corporate social responsibility programs by LSM companies provide some community benefits but are no substitute for wealth distribution through taxes, royalties, and local procurement.

## **2.2 Gold mining in Ghana**

LSM in Ghana contributes significantly to the economy in terms of direct employment creation and GDP growth. Aryee (2001) reports that the mining sector accounted for over a third of Ghana's total export revenues in recent years. Atta-Quayson (2022) asserts that gold exports alone made up 48.4% of Ghana's total export revenues in 2019. In addition to export earnings and tax revenues, the mining sector also has extensive linkages with other sectors of the economy. Mining activities drive demand for inputs like equipment, spare parts, fuel, chemicals, explosives

and utilities. The development of gold mining infrastructures opens access to new areas and provides key transport links (Bloch & Owusu, 2012).

As of 2020, as reported by Sturman, Toledano, Akayuli and Gondwe (2020), Ghana boasted approximately 16 registered Large-Scale Mines (LSMs), which collectively injected a substantial sum of US\$3.73 billion into the country's economy during the 2019 production year. This considerable investment underscores the significance of the mining sector in Ghana's economic landscape, particularly in terms of revenue generation and foreign direct investment. Moreover, the cumulative gold output from these LSMs in 2019 amounted to an impressive 2,986,837 ounces, further solidifying Ghana's position as one of the leading gold-producing countries globally. This robust production not only contributes to the country's GDP but also enhances its competitiveness on the global stage, positioning Ghana as a prominent player in the international mining market.

In addition to the substantial financial contributions, LSMs in Ghana play a pivotal role in employment creation, both directly and indirectly. According to data from the Ghana Statistical Service (GSS) in 2019, the direct workforce engaged in LSM witnessed a notable increase to 11,899 individuals, compared to 10,109 in the preceding year. This uptick reflects an 18% growth in employment opportunities within the sector, highlighting its capacity to absorb a significant portion of the labor force. It is noteworthy that the composition of the workforce within LSMs predominantly comprises Ghanaian nationals. In 2019, only 144 out of the total direct workforce were expatriates, accounting for a mere 1.2% of the workforce. This indicates a concerted effort by LSMs to prioritize local hiring and foster indigenous talent development, thereby contributing to the socio-economic empowerment of Ghanaian communities. The relatively low proportion of

expatriates within the workforce, compared to previous years, demonstrates a trend towards greater localization and skills transfer within the mining sector.

The expansion of the mining sector, particularly Large-Scale Mines (LSMs), emerged as a prominent driver of real economic growth in Ghana (Sturman et al., 2020). This expansion contributed significantly to the increase in real economic output from GH¢154.548 billion in 2018 to GH¢164.560 billion in 2019, measured using 2013 constant prices. This represented a notable growth rate of 6.5% in 2019, surpassing the previous year's growth rate of 6.3%. Such growth in the mining sector played a crucial role in propelling Ghana's overall economic performance during this period. This economic expansion was particularly noteworthy given the global context of decreasing demand for gold. Despite a 1% decline in global gold demand from 4,401 tons in 2018 to 4,335 tons in 2019, as reported by Worlanyo, Alhassan and Jiangfeng (2022), the Ghanaian gold market experienced a surge in production during the 2019 production year. This resilience in the face of global trends speaks to the strength and resilience of Ghana's mining sector, demonstrating its ability to withstand external pressures and continue contributing positively to the country's economic growth trajectory.

Small-scale mining (SSM) has indeed been a significant part of Ghana's history, with its roots tracing back to the colonial gold rushes of the late 1800s (Abdulai, 2017). During times of economic downturns, particularly in the 1970s and 1980s, SSM experienced rapid expansion as it emerged as a crucial survival strategy for many rural communities. This growth was driven by the necessity for alternative livelihoods amidst economic challenges, leading to an increasing number of individuals turning to small-scale mining as a means of sustaining themselves and their families. By the late 1990s, SSM had become a substantial sector within Ghana's mining industry, with estimates suggesting that between 200,000 to 300,000 people were engaged in small-scale mining



activities during this period. Notably, SSM contributed significantly to Ghana's total gold output, accounting for approximately 15-31% of the country's gold production (Hilson & McQuilken, 2014). This highlights the substantial role that small-scale mining played in Ghana's overall gold production landscape, complementing the efforts of larger mining operations.

One of the most noteworthy aspects of SSM is its role in providing livelihood opportunities for marginalized and vulnerable groups within Ghanaian society. Rural dwellers, unemployed youth, school dropouts, and northern migrants often find employment and income through participation in small-scale mining activities (Benyin, 2020). For these individuals, SSM represents a vital source of income and sustenance, allowing them to support themselves and their families in the absence of formal employment opportunities. Mallo (2012) posits that the accessibility of small-scale mining is another key characteristic that distinguishes it from larger-scale mining operations. Unlike industrial mining, which often requires substantial capital investment and specialized technical skills, SSM can be undertaken with relatively little financial resources and only basic technical know-how. This accessibility makes small-scale mining a viable option for individuals with limited education and opportunities, democratizing access to the benefits of Ghana's mineral wealth and fostering economic inclusion within the mining sector.

Small-scale mining (SSM) in Ghana encompasses various techniques, reflecting the diverse methods employed by individuals and communities engaged in informal mining activities (Bansah, Yalley & Dumakor-Dupey, 2016). These techniques typically include shallow open pit excavation, tunneling into sedimentary deposits (referred to colloquially as "ghetto" mining), and dredging, sluicing, and panning of alluvial sediments from riverbeds and banks. Each method is characterized by its rudimentary nature, often relying on manual labor and basic tools for extraction. Despite their prevalence, these rudimentary mining methods often yield low ore

recovery rates, posing challenges for miners in maximizing the extraction of valuable minerals. For instance, tunneling and sluicing techniques may recover only a fraction—around 30-40%—of the gold deposits present in the mined material (Andrews, 2015).

Al-Hassan, Yaganuma and Odoi (2019) advances that to concentrate gold from the extracted material, most SSM operators in Ghana rely on mercury amalgamation, a centuries-old technique that poses significant health hazards and environmental risks. Mercury, a toxic substance, is used to bind with gold particles, forming an amalgam that is later heated to vaporize the mercury, leaving behind the gold. However, the improper handling and disposal of mercury during this process can lead to severe health consequences for miners and contaminate land and waterways, endangering both human health and the environment. In addition to mercury pollution, SSM activities in Ghana contribute to a range of other environmental impacts, including land degradation, deforestation, air pollution, and noise pollution. The open pit excavation and dredging operations can result in the disruption and destruction of natural habitats, while the use of heavy machinery and equipment can generate noise pollution and emissions harmful to both humans and wildlife. Furthermore, the clearing of vegetation for mining activities can lead to deforestation, exacerbating ecological degradation and loss of biodiversity in affected areas.

Small-scale mining (SSM) in Ghana operates within a framework that distinguishes between legal and illegal operations, a categorization largely determined by compliance with the Minerals and Mining (Amendment) Act, 2019 (Act 995). This legislation sets out the regulatory framework governing mining activities in the country, defining the rights, obligations, and responsibilities of mining operators. However, despite efforts to formalize the sector, numerous economic, social, political, regulatory, and technological factors contribute to the persistence of illegal SSM activities. While the Minerals and Mining Commission is tasked with overseeing the

registration and legalization of mining operations in Ghana, the scale of unlicensed and unregistered SSM remains significant (Worlanyo, Alhassan & Jiangfeng, 2022). The authors of the cited study acknowledge that while approximately one million individuals engage in licensed SSM, it is estimated that twice that number operate in the informal sector, operating without the necessary permits or regulatory oversight. The registration process for small-scale mining concessions in Ghana entails obtaining licenses from the appropriate regulatory authorities.

Historically, the Mining and Minerals Commission has played a central role in this process, licensing and registering concessions for operation. As of 2002, the Commission had licensed and registered 420 SSM concessions, predominantly for gold mining, with a smaller number allocated for diamond mining. However, by 2016, the number of licenses had increased substantially, reaching 1,436, reflecting the growing interest and activity in the small-scale mining sector (Bansah, Yalley & Dumakor-Dupey, 2016). The proliferation of licensed SSM concessions underscores the sector's importance in Ghana's mining industry and its contribution to employment, income generation, and local development. However, challenges persist in ensuring effective regulation and oversight, particularly concerning illegal mining activities and environmental degradation. The government, in collaboration with regulatory agencies and stakeholders, continues to explore strategies to address these challenges, including strengthening enforcement mechanisms, enhancing community engagement, and promoting sustainable mining practices. The efforts to formalize and regulate the small-scale mining sector are essential for maximizing its potential contributions to Ghana's economy while minimizing its negative social and environmental impacts.

## **2.3 Theoretical framework**

This study concedes that the perception of gold mining in the Nkwanta Community can be explained by a myriad of factors. Specifically, this study employs complex systems and social exchange theories in explaining the phenomenon.

### ***2.3.1 Complex systems theory***

Complex systems theory is an interdisciplinary field of study that investigates how complex systems behave and interact. The theory evolved through the contributions of many scholars over time. Some notable figures in the development of complex systems theory include John H. Holland, Murray Gell-Mann and Stuart Kauffman among others. A complex system is defined as a system made up of multiple interacting components that exhibit emergent behavior, i.e., behavior that cannot be predicted by analyzing the individual components in isolation (Holland, 2012). The complex systems theory has been used in social sciences to analyze various phenomena, including urbanization, globalization, and socio-economic development. Pumain (2006) employed the complex system theory in explaining the interactions between diverse urban agents, such as individuals, organizations, and institutions, that shape urban growth and development. Equally, Meadows (2008) explored and used the complex systems theory in examining the interactions between different factors that contribute to development outcomes, such as economic growth, poverty reduction, and social inclusion.

In the context of gold mining, the complex system theory can be used to explore how people perceive and interact with the mining industry. The theory can be applied to examine the different components that make up the gold mining system, including the miners, the mining companies, the government, and the surrounding communities. A key concept from complex systems theory is feedback loops, whereby the outputs of a system feedback into the system as

inputs, creating self-reinforcing or self-correcting dynamics. The theory observes that both positive and negative feedback loops may operate around gold mining. For example, economic benefits from mining that improve local development could bolster community support for mining activities. This positive feedback could reinforce acceptance of mining. On the other hand, environmental damage or unequal distribution of benefits could trigger anti-mining sentiments in the community, creating a negative feedback loop that fuels resistance to mining projects.

Equally, the actions of the mining companies can have a significant impact on the local communities and their perceptions of the industry. Using a complex systems lens reveals how these negative practices may become normalized and systematically reinforced over time. For example, if mining companies prioritize profit over social and environmental responsibility, they may engage in practices that harm the surrounding communities, leading to negative perceptions of the industry. Mining companies operate under shareholder pressure for profit maximization as such explore techniques to cut cost at the expense of proper environmental controls and community engagement. These practices are usually enabled by weak governmental oversight and their impacts on the local communities receive minimal attention from the media and civil society. This allows harmful practices to become entrenched and form self-perpetuating patterns that are challenging to disrupt. Consequently, this can lead to the community's social and political resistance to mining activities. Similarly, the actions of the government can also shape perceptions of the industry. If the government fails to regulate the industry effectively, this can lead to environmental degradation, labor abuses, and other negative impacts. These negative impacts can further fuel negative perceptions of the industry.

Equally, the complex system theory can also be used to examine how perceptions of gold mining evolved over time. A key principle from complex systems theory is that a complex system

is sensitive to initial conditions, whereby small changes in initial conditions can lead to vastly different outcomes over time. As different components of the system interact with each other and with external factors, such as changes in global demand for gold or new environmental regulations, the perceptions of the industry can shift. In the context of gold mining, subtle shifts in government policies, company practices, civil society pressures or local community responses in the early stages of a mining project can put it on a trajectory towards either acceptance or resistance. For example, if a mining company implements environmentally responsible practices, this may improve perceptions of the industry among local communities and the public. This path dependency highlights the importance of proactive engagement and responsible practices from the very outset, rather than reacting once negative perceptions take root.

The complex systems theory can be criticized for focusing on emergent properties and self-organization, which may downplay the role of agency and intentionality of individuals in shaping social phenomena. While the theory highlights the interconnectedness and dynamic nature of social systems, it may overlook the deliberate actions and decisions made by individuals and groups within these systems. In the context of gold mining, this critique suggests that the complex systems theory might not adequately account for the role of human actors—such as miners, community members, government officials, and corporate stakeholders—in shaping the dynamics of the industry. Moreover, critics contend that the complex systems theory may fail to fully grasp the power dynamics inherent in the gold mining sector. The theory's focus on emergent properties and self-organization may obscure the influence of hierarchies, inequalities, and vested interests that characterize the industry. These power dynamics can manifest in various ways, including unequal distribution of resources, exploitation of labor, and marginalization of affected communities.

Despite criticisms, the complex systems theory continues to offer valuable insights into how people perceive gold mining and the dynamics at play within the industry. Thus, by focusing on the interactions and feedback loops between various actors—such as miners, community members, government officials, and corporate stakeholders—the theory provides a framework for understanding the complex web of relationships that shape perceptions and attitudes towards mining activities. One of the strengths of complex systems theory lies in its ability to elucidate how perceptions of gold mining can evolve over time. The complex theory examination of the dynamic interactions between different factors—such as environmental degradation, economic benefits, cultural beliefs, and social norms—helps elucidate why and how people's attitudes towards mining may change in response to shifting circumstances. For example, communities may initially welcome mining operations due to the promise of economic prosperity, only to become disillusioned as they witness the negative environmental and social impacts over time.

#### ***2.3.1.1 Complex System Theory and Mining in a global context.***

(Queiroz et. al. (2017) noted that while the mining industry is often and generally complex due to its many operations, safety is its main concern in their analysis of risk management in the sector. According to Haas and Yorio (2016), an organization's health and safety management system (HSMS) performance is "a critical and pressing issue." The main environmental stresses in this field, according to Nelitz et al. (2015), include human encroachment on ecosystems, gas emissions, air noise and dust, soil disturbance and contamination, linear infrastructure, traffic, solid waste on land, and water pollution. These vectors must be considered in the understanding of

#### ***2.3.1.2 The complex systems theory and gold mining in Ghana.***

In the context of Ghana, complex systems theory can be applied to understand the intricate interactions and feedback loops involved in the gold mining industry. The Complex systems theory

encourages viewing the gold mining industry as a complex adaptive system with interconnected components, including environmental, social, economic, and political factors. This perspective helps in understanding how changes in one aspect of the system can have ripple effects throughout the rest of the system. Equally, complex systems theory highlights the network of actors, including government agencies, mining companies, local communities, and international stakeholders in the gold mining industry. For instance, the industry is characterized by both LSM and ASM, each with its own economic, social, and environmental impacts. LSM contributes significantly to GDP, government revenue, exports, and large-scale job creation at the national level. However, at the local level, ASM provides more dispersed livelihood benefits and circulation of income in communities.

From the discourse above, it is revealed that gold mining is a multifaceted industry that involves intricate interactions between mining actors, as well as environmental, economic, social, and regulatory factors. Complex adaptive systems (CAS) theory provides a lens through which we understand the dynamic and evolving nature of gold mining operations. The theory provides a lens through which we understand why some communities might resist or embrace mining activities. Thus, by exploring how collective behaviors and attitudes occur via the complex interactions between individual actors and their environment. The theory also brings us closer to understanding the complex dynamics that underpin community responses to gold mining projects. For example, communities may mobilize against mining activities in reaction to perceived risks to their livelihoods, cultural heritage, or environmental well-being, resulting in the formation of new social movements and advocacy campaigns (see Banerjee, Maher, & Krämer, 2023).

On the other side, adaptation and transformation of structures may occur. Gold mining operations are subject to constant change and adaptation in response to internal and external



pressures. CAS theory emphasizes the adaptive character of complex systems, in which actors constantly alter their behaviors and methods to deal with changing circumstances. This adaptability could include communities' renewed interest in embracing the project due to perceived benefits or technological advances in mining processes, or responses to regulatory changes. Recognizing mining systems' adaptive capacity allows all stakeholders to engage in more flexible and robust management approaches. In short, complex theory illuminates the complexities of mining dynamics and their consequences for communities, economies, and the environment.

### ***2.3.2 Social Exchange Theory***

Social exchange theory seeks to explain social relationships and interactions in terms of the exchange of resources between individuals or groups (Cropanzano & Mitchell, 2005; Cook, Cheshire, Rice & Nakagawa, 2013). The central theme of social exchange theory is that people's actions are driven by the desire to maximize their rewards and minimize their costs in social relationships. It posits that individuals engage in social interactions only when they perceive that the potential rewards outweigh the potential contexts. This implies that people will support gold mining activities as long as the benefit of mining outweighs the negative effects. Homans (1958) advanced that social behavior is determined by the perceived balance of costs and rewards in relationships, with individuals engaging in social interactions that they perceive will lead to the greatest reward. Blau (1964), expanding on this position, argues that social structures, such as social class and organizational hierarchy, influence the distribution of resources and power in social relationships.

According to this theory, individuals engage in social interactions and relationships with others to maximize their benefits while minimizing their costs (Blau, 1964). People engage in exchanges that they believe will result in positive outcomes for themselves. When individuals

engage in social exchange, they assess the rewards they will receive from the interaction and compare them with the costs they will incur. If the rewards outweigh the costs, they will engage in the exchange, and vice versa (Homans, 1958). In the context of gold mining, people's perception of the industry can be influenced by the rewards and costs associated with it. For example, if an individual believes that working in a gold mine will provide them with a high income and social status, they may perceive the industry positively. On the other hand, if an individual believes that working in a gold mine will expose them to health risks and environmental hazards, they may perceive the industry negatively.

In addition, the social exchange theory suggests that individuals engage in exchanges not only for material rewards but also for social rewards, such as love, respect, and social status (Blau, 1964). Therefore, people's perceptions of gold mining may also be influenced by the social rewards associated with working in the industry. It must be reiterated that beyond material costs and benefits, social meanings ascribed to mining shape perceptions. In some societies, mining may confer prestige and status for workers who can provide for their families. Yet others may view mining as dangerous and undesirable work. Cultural stigma around mining labor could discourage participation just as local valorization of mining jobs might encourage engagement. Thus, subjective social rewards beyond pure economic incentives factor into whether communities embrace or resist mining activities.

The distribution of costs and benefits from mining activities frequently exhibits disparities, leading to varying perceptions among different groups involved. Local communities, for instance, often bear the brunt of environmental degradation, health risks, and social disruptions associated with mining operations, while reaping only limited economic benefits (Garvin, et al., 2009; Hilson, 2002). The extraction of natural resources may result in the depletion of water sources, soil

contamination, air pollution, and habitat destruction, which can have profound and long-lasting impacts on the well-being and livelihoods of community members. Furthermore, the economic benefits that do accrue from mining activities are often unevenly distributed. While government officials and elites may capture a significant share of mining revenues through taxes, royalties, and licensing fees, these funds may not be adequately reinvested in the development of mining regions. Instead, they may be diverted to other areas or used for purposes unrelated to community development, perpetuating inequalities and exacerbating socio-economic disparities between mining-affected communities and other regions (Garvin, et al., 2009).

According to Badenhorst (2006), employees working in the mining sector also face challenges, as they often endure hazardous working conditions and occupational health risks. Despite earning income from their employment, many workers may be exposed to unsafe working environments, such as underground mines or open pits, where accidents, injuries, and fatalities are not uncommon. Additionally, the transient nature of employment in the mining industry can contribute to job insecurity and precarious livelihoods for workers and their families (Ofosu & Sarpong, 2022). Gender dynamics further compound the impacts of mining activities, with women often bearing a disproportionate burden of the negative consequences. Women are frequently responsible for household water collection and agriculture, making them particularly vulnerable to water contamination and loss of farmlands resulting from mining activities (Hinton, Veiga & Beinhoff, 2003). Moreover, the influx of predominantly male migrant workers into mining areas can disrupt social norms and traditional gender roles, leading to increased gender-based violence, family breakdowns, and other social tensions within affected communities (Hinton et al., 2003).

The social exchange theory can be criticized for the assumption that people engaging in gold mining are using rational decision-making based on cost-benefit analysis, overlooking the

impact of emotions, values, and norms. In reality, emotions and values can strongly influence perceptions and decisions about mining, especially when issues of environmental degradation and social justice are involved. Equally, the theory fails to account for power imbalances and structural inequalities that can influence the perceived benefits and costs of gold mining for different groups. The disparities in power and access to capital can skew the distribution of mining costs and benefits, leading to divergent community perceptions and potential grievances. Finally, the theory tends to focus on individual decision-making, neglecting the role of social networks, cultural norms, and institutional arrangements in shaping perceptions of gold mining. The influence of traditional leaders or religious authorities on community perceptions may not be captured by the social exchange theory.

Despite these criticisms, the social exchange theory remains a valuable framework for understanding the dynamics of social relationships and the motivations behind social behavior, including people's perceptions of gold mining. The theory posits that individuals engage in social interactions based on the expectation of maximizing rewards and minimizing costs, with the underlying assumption that human relationships are essentially transactions in which individuals seek to achieve favorable outcomes for themselves.

#### **2.4 Empirical review on public perception of gold mining**

Existing literature provides insights into the public perception of gold mining. In recent years, concerns about the impacts of gold mining have raised public awareness and shaped public perception. These studies have revealed a complex web of attitudes and beliefs held by various stakeholders, including local communities, environmental activists, government authorities, and mining companies. Many people view gold mining as a destructive and unsustainable practice, with significant negative impacts on the environment and local communities whilst others

postulate the potential economic benefits and job opportunities that gold mining can bring to their community.

#### ***2.4.1 Environmental impact***

Recent studies have delved deeper into the public perception of the environmental impact of gold mining. Local communities residing near gold mining operations consistently express negative perceptions regarding the industry's environmental impact. This sentiment concerns center on the threat of gold mining on water quality through pollution from chemicals, heavy metals, and sedimentation; air quality from dust and emissions; land degradation and destruction of forests, impacting the natural biodiversity and ecosystem. Existing studies in Ghana offer compelling examples of these negative perceptions. Hilson (2003), using, semi-structured interviews and focus group discussions with community members, government officials, and mining company representatives, documented community concerns about water pollution, land degradation, and health impacts from both large-scale and artisanal small-scale gold mining.

Similarly, Quarm et al. (2022) found an overwhelming majority of respondents believed that artisanal and small-scale gold mining (ASGM) severely harms the environment. Specifically, 92% said ASGM pollutes water quality. Additionally, 87% perceived that ASGM causes deforestation, 84% felt it degrades land, and 78% saw the mining practice as source of air pollution. This signals near consensus among participants that ASGM damages local ecosystems and environments in multiple ways, from contaminating waterways to destroying forests and emitting dust particles into the air. With such a high percentage across all categories, the study strongly highlights local concerns about the negative impacts of artisanal and small-scale gold mining in their communities. Equally, Awatey (2014) focusing on the Amansie West District in the Ashanti

Region, established that majority of the respondents considered small-scale mining to have negative environmental impacts on their lands, a key element for their livelihoods.

Comparable results have been documented across other countries as well. For example, Sana et al. (2017) investigated the knowledge and perceptions of artisanal gold miners in Burkina Faso regarding the health and environmental risks associated with their work. It employed a cross-sectional survey of 200 miners over 18 years old in two artisanal gold mines. The study showed that approximately 49.5% of respondents could identify at least three environmental impacts specifically, respondents were concerned about water pollution and land degradation. This study provided valuable insights into the perceptions of artisanal gold miners regarding the health and environmental risks they face. In Cameroon, Kamga et al. (2018) found residents perceiving gold mining as degrading various environmental aspects, impacting their lives and livelihoods. The authors employed focus group discussions with community members living near gold mining sites in Cameroon and established participants perceived gold mining as degrading the environment, leading to water pollution, soil erosion, and deforestation. These cases reinforce the pattern seen in Ghana of mining activities garnering negative perceptions within proximate communities related to the threat posed to local land, water sources, forests and general ecosystem viability. Though details may vary across contexts, the emergent theme is a shared sense of environmental risk and harm amongst populations closest to gold mining operations.

#### ***2.4.2 Socio-economic impact***

An alternative viewpoint in literature highlight perspectives on the socioeconomic impacts of gold mining operations on local communities. These perspectives reflect a complex and nuanced range of experiences. While some case studies identify limited economic opportunities and environmental degradation that breed community dissatisfaction (Sehol et al., 2022; Nguyen et al.,

2018), others highlight more positive impacts from job creation, infrastructure development and rising incomes that mining stimulates (Chuhan-Pole et al., 2017; Wille, 2016; Maliganya & Paul, 2017). Across multiple contexts - from Indonesia to Vietnam, Burkina Faso and Tanzania - a common theme emerges around mining's tendency to deliver uneven distribution of benefits and burdens at the community level. The Sehoul et al. (2022) study in Indonesia reveals a common thread seen across several cases - concerns about environmental damage and inadequate economic transition planning that leave communities feeling shortchanged. Similarly, Nguyen et al. (2018) documents the predominant negative views in Vietnam centered on destructive environmental and social consequences, combined with frustrations over lack of government oversight.

Meanwhile, the Chuhan-Pole et al. (2017) analysis of three African countries unveils more heterogeneous impacts at the community level, with some benefiting economically while others face displacement and unrest. This aligns with the spectrum of perceptions found in the Tanzanian focused studies of Wille (2016) and Maliganya & Paul (2017)- highlighting how even within a country, community experiences with mining can widely vary, from income gains for some groups to environmental risks that undermine livelihoods for others. Maliganya & Paul (2017) advances that respondents attributed economic advantages and investments in things like health clinics or schools to the gold mining in their communities, reflecting their positive perceptions. Similarly, Wille (2016) identified some positive perceptions among respondents regarding increased income and job opportunities. A central theme seems to be mining's tendency to generate uneven outcomes across economic, environmental and social dimensions at the local level. How costs, benefits and risks are distributed influences community perceptions, resulting in a range of positive to negative views.

Several studies have examined local community perceptions of the socioeconomic impacts of artisanal and small-scale gold mining in Ghana, employing a range of qualitative and quantitative methods. Obiri et al. (2016) adopted a mixed-methods approach combining surveys, focus groups and interviews in the Tarkwa Nsuaem municipality. They documented negative views centered on threats to livelihoods, environmental degradation, health risks and social tensions as well as frustration over limited economic benefits and labor exploitation. Aligning with these findings, Quarm et al. (2022) utilized participatory rural appraisals in the Amansie West District and found analogous community concerns over reduced agricultural outputs, water contamination, broken corporate promises and inaccessibility of mining jobs. Meanwhile, Benschaul-Tolonen et al. (2019) employed a large-scale household survey across Ghana that revealed more varied perceptions - some communities reported increased incomes and infrastructure improvements near mines, while others faced unequal benefit-sharing, environmental damage and conflicts. This study importantly highlighted that proximity to mines and socioeconomic status influenced community perspectives.

While the scope and methods of analysis differ across these studies, together they unpack multi-faceted community experiences living amidst Ghana's gold mining boom. The predominant theme across all cases is one of skepticism and concern over the uneven socioeconomic impacts that mining introduces - elevating risks and hardships for some while providing opportunities and development for others. The grievances over inequities, exclusion and unchecked environmental externalities appear widely shared, even as some segments of society see positive transformations. The complex interplay between costs and benefits shapes the continuum of community perceptions.

#### ***2.4.3 Health risks and safety concerns***



Gold mining activities can introduce a range of environmental health hazards and risks to nearby communities. Existing studies have assessed local perceptions of the public health impacts associated with mining operations as such provided critical insights into how these externalities are directly experienced by affected populations. Using surveys, focus group discussions, interviews and other participatory appraisals, researchers have documented a spectrum of health concerns voiced by community members regarding the effects of exposure to things like air and water pollution, toxins like mercury and cyanide used in processing, and emerging risks like higher incidence of communicable diseases linked to migration and settlement patterns around mines. Several studies from Sub-Saharan Africa document a range of environmental health hazards and risks that community members perceive from local mining operations. In Tanzania, Charles et al. (2013) carried out a cross-sectional survey assessing public knowledge and perceptions related to arsenic and mercury contamination from artisanal gold mining effluents. They found high general awareness of water pollution issues but limited understanding of specific exposure pathways and associated morbidities. Participants voiced concerns about long-term health consequences, especially for children.

Similarly, research from Burkina Faso by Sana et al. (2017) using surveys with artisanal miners revealed recognition of occupational health hazards like mercury poisoning, respiratory illness, and skin diseases. However, economic incentives and livelihood constraints still drove participation for many, pointing to complex poverty-health tradeoffs. Expanding focus beyond direct exposures, Himmelsbach et al.'s (2023) key informant interviews around industrial mining in Burkina Faso highlighted knock-on impacts on community health from things like nutrition declines when agricultural productivity falls as well as systemic barriers to healthcare access. Meanwhile in Cameroon, Ralph et al. (2018) employed community surveys to assess perceptions

of health and environmental impacts from artisanal mining, finding worries over higher prevalence of diarrhea, skin disorders, and respiratory conditions given waste discharges into local waterways.

Furthermore, across multiple studies spanning artisanal and industrial operations in Tanzania, Indonesia, Colombia, and the Democratic Republic of Congo, common themes emerge regarding heightened health risks posed by contamination of air and water supplies in mining regions. Clinical health assessments verify issues like heavy metal exposures and prevalence of respiratory illness and dermatological conditions among mine workers (Bose-O'Reilly et al., 2010). At community levels, anxieties persist over nutritional deficits, skin disorders, pulmonary diseases, and reproductive health impacts tied to environmental pollution from mining effluents. Qualitative research provides critical insights into the gender dimensions of these popular health grievances. As Leuenberger et al. (2021) document through interviews and discussions with female residents proximate to industrial mines in Tanzania, women report bearing a disproportionate burden of health issues like respiratory disease, dermatitis, and pregnancy complications believed to result from contamination exposure. Broader worries over declining regional food security and water safety amplify their anxieties over family wellbeing. These accounts align with similar gendered experiences relayed by female mine workers in Columbia (Vélez-Torres et al., 2018) and the DRC (Geenen et al., 2022).

Finally, research from mining communities in Ghana echoes findings from across Sub-Saharan Africa, affirming local recognition of occupational and environmental health hazards introduced by regional extraction activities alongside systemic barriers that exacerbate risks. Surveys with artisanal miners in Obuasi by Atakora and Stenberg (2020) indicate strong general understanding of potential morbidities like respiratory illness, dermatitis, and mercury poisoning. However, limited healthcare infrastructure and inadequate protective equipment leave many

apprehensive about managing likely exposures given economic pressures to continue participation. Complementary work by Antabe et al. (2017) around industrial mines substantiate pollution pathways underpinning wider community perceptions of negative health impacts. Proximity analysis reveals residents nearer active pits report greater perceptibility of and concerns over dust and odor emissions. The belief that odors could harm health was associated with poorer self-assessed wellbeing even for those in farther settlements, signaling diffuse psychosocial stresses around environmental risks. Though seeing dust lacked similar correlations, uncertainty over exposure risks and absent healthcare access still reinforced overall community anxieties.

Together, these cases spotlight how Ghanaians in mineral-rich locales share many of the same health impact concerns documented across other mining areas of Sub-Saharan Africa. In totality, the body of literature spotlights pathways through which mining activities, both artisanal and commercial scale, generate acute environmental health impacts as well as systemic risks straining community public health across affected regions. Women and children typically shoulder the greatest burdens, though vulnerabilities cut across gender and age groups. The health concerns expressed encompass not only direct morbidities from contamination but wider social determinants that undermine public health, including loss of livelihoods and nutrition deficits when agricultural yields decline.

#### ***2.4.4 Impact on the Indigenous people's rights and culture***

Mining activities, including gold extraction, can have profound cultural impacts on nearby communities and regions where operations are located. The introduction of an industrial mining economy into rural locales often catalyzes rapid socioeconomic shifts that displace traditional lifestyles and belief systems. Several studies have investigated the complex social impacts of artisanal and small-scale gold mining across sub-Saharan Africa, underscoring concerns around

gender dynamics, labor conditions, governance structures, and community ties. In-depth field investigations in Kenya by Mugo, Ondieki-Mwaura & Omolo (2020) pointed to restrictive sociocultural norms undermining the decision-making authority and financial security of women working in artisanal mining. Through participatory workshops conducted in the Taita Taveta region, the researchers identified worries around mining activities potentially reinforcing gender inequities and increasing female miners' vulnerability.

Meanwhile, long-term embedded research examining informal ASM groups in Zimbabwe by Chipangura (2019) revealed cooperative institutions have organically emerged to regulate access, revenue distribution, and working arrangements between miners. However, the study found these adaptive governance structures still lacked official recognition and policy support from national authorities. Parallel qualitative work by Serwajja & Mukwaya (2020) involving focus groups and interviews with Ugandan female ASM participants underscored perceived erosion of family support networks and cultural stigmatization tied to their mining livelihoods. Many relayed experiences of social marginalization and isolation, with some citing suspected links between the expansion of mining and increased rates of domestic violence.

Furthermore, research examining the sociocultural impacts of mining expansion in both Indonesia (Rianse et al., 2021) and Turkey (Avci et al., 2010) illuminates several common tensions around governance authority, cultural preservation, and land access for indigenous and rural communities facing encroaching mining interests in their ancestral or traditional territories. In the Indonesian context, in-depth interviews and observations revealed substantial worries among indigenous Sulawesi groups over the erosion of their traditional leadership structures and customary land stewardship practices in the face of growing corporate control over extraction projects. Their findings expose risks around the displacement of communal governance and tenure

traditions long tied to these groups' identity and social fabric. Similarly in Turkey, analysis of debates between local preservation advocates and national mining proponents at Mount Ida exposed divides over decision-making influence regarding land use and natural resource allocation. Avci et al (2010) advances that rural residents asserted cultural and livelihood interests in safeguarding regional heritage and biocultural diversity, while centralized state development agendas favored opening the area to gold mining - with little input from or consideration for those populations most impacted on-the-ground.

Finally, research conducted in Ghana highlights several key tensions that can emerge around mining operations and impacts on local communities. Awuah-Nyamekye and Sarfo-Mensah (2012) interviews with indigenous residents underscored strong concerns that expanding mining activities were encroaching upon and endangering sacred ancestral lands as well as interrupting customary belief practices and stewardship traditions tied to these areas. This signals risks of cultural disruption and loss of access to ceremonial sites holding deep meaning. Similarly, ethnographic work by Mengba et al (2022) in rural mining settlements indicated local perceptions that the influx of operations had begun introducing turmoil around gender roles and erosion of women's traditional authority. This points to mining potentially undermining social status and family stability.

In addition, Garvin et al (2009) discussions with both community leaders and company representatives exposed perceptions of uneven distribution of mining revenues as well as marginalization of locals from decision-making around land use permits and allocation of economic benefits from extraction taking place on areas tied to their heritage and livelihoods. This illuminates an imbalance around who exerts control, oversight, and returns from natural resource development. Together, the research underscores concern across local Ghanaian communities over

threats mining can pose in terms of cultural continuity, gender equity, economic access, and governance inclusion - highlighting needs for more participatory approaches ensuring representative involvement and equitable distribution of costs, profits and oversight roles.

#### ***2.4.5 Governance and regulatory concerns***

Several recent articles have explored concerns around governance and repeated calls for more responsible, equitable approaches to managing risks and benefits from gold mining operations, especially in developing country contexts. Abraham et al. (2018) underscores the mixed track record of corporate-led CSR initiatives in addressing community development priorities and environmental protection around mining sites in Ghana. This is because despite the stated commitments to CSR from companies, their study found perceived gaps in implementation and oversight to ensure programs translate to positive outcomes rather than mere public relations exercises. They advocate for more binding regulations and participatory monitoring mechanisms to hold companies accountable to CSR spending that aligns with locally defined needs.

Similarly, Mutti et al. (2012) relay frustrations voiced by civil society groups over inadequate involvement, consultation and communication between gold mining firms and impacted communities in Burkina Faso and Ghana around CSR efforts. Locals expressed disappointment around unfulfilled corporate promises and one-sided decision making around development projects meant to provide community returns from mineral wealth extraction in their regions. The authors argue lack of formal requirements for participatory CSR approaches risks breeding distrust and tensions around mining operations. Adding further context, Bugri and Kumi's (2018) interviews with mining-adjacent residents in rural Ghana indicated perceptions that promised CSR benefits often remained unrealized, while communities continued carrying heavy burdens from land loss, environmental damage and social disruption from intensive mining. The

authors argued that study participants called for more responsive and transparent mechanisms to channel corporate investments toward locally defined development priorities as well as provide platforms for community monitoring and grievance redress regarding persistent impacts.

Furthermore, other studies have underscored community concerns for more responsible, participatory approaches to large-scale mineral development projects affecting local lands and livelihoods. Armah et al. (2011) conducted focus groups among indigenous residents and resettled farmers in a gold mining region of Ghana, finding considerable anxieties around loss of agricultural land access, influxes of outsiders stoking social tensions, perceived increases in prostitution and health risks from contamination, and frustrations over lack of voice in decision-making around licensing deals and oversight. The community members widely held negative views of mining companies and government officials' interests in personal profits over community welfare, calling for institutional reforms to better incorporate local consultation and more equitable distribution of economic returns from extraction of the region's gold deposits.

Similarly, Wireko-Gyebi et al. (2020) applied a vulnerability assessment framework integrating scientific data and community perceptions to gauge impacts of mining in Ghana's Upper Denkyira East municipality. The study, alongside biophysical damage from land disturbance and pollution, exposed strong local worries about threats to health, housing, and sociocultural fabric from unregulated mining rushes, but also feelings of powerlessness in influencing stronger protections or accountability from governing bodies meant to represent their interests. Meanwhile, Bugri and Kumi (2018) underscored the importance of responsive communication channels for mining-adjacent residents in Ghana to relay concerns and priorities, as well as participate in monitoring real-world effectiveness of promised corporate social investments meant to provide community returns but often falling short. Their interviews indicated

continued disenfranchisement fueling negative views around mining despite stated industry commitments to responsibility.

Moreover, other sections of literature have delved into perceived shortcomings and call for reforms to better mitigate risks and distribute benefits equitably to often marginalized mining-adjacent communities. For example, O’Callaghan and Vivoda’s (2015) study highlighted the failures of centralized, resource nationalist approaches to mineral governance across select Asian countries, arguing top-down policymaking and narrow economic priorities driving regulation make little room for meaningful integration of environmental protections or community development needs on-the-ground. The authors advocate decentralized governance reforms enabling more inclusive, participatory decision-making and priority-setting around mining that empowers locally attuned responses. Equally, Andrews’ (2016) study of corporate-community tensions around gold mining in Ghana points to wider governance gaps allowing sidelining of rural citizen welfare in favor of urban elite business interests in regulatory oversight of the sector’s boom. The author argues current frameworks fail to bind companies to adequate consultation and equitable distribution of economic returns to oft-exploited indigenous landowners. The author calls for institutional changes to increase corporate accountability as well as platforms for participatory monitoring of industry impacts.

Adding further nuance, Mensah’s (2021) legal analysis spotlights challenges for formal state mining regulations to align with customary land tenure institutions long predating Ghana’s contemporary governing system but still recognized as authoritative by many rural small-scale mining operators. The study indicates clashes between legal pluralism and mining formalization efforts risk exacerbating criminalization of artisanal miners without providing viable alternative livelihood options. These studies indicate perceived failures of existing regulatory approaches to



adequately protect vulnerable populations or environments, enable participatory priority-setting, ensure equitable and responsive industry oversight, or account for on-the-ground sociocultural complexities around mining activities - underscoring calls from critics and communities for more radical reforms.

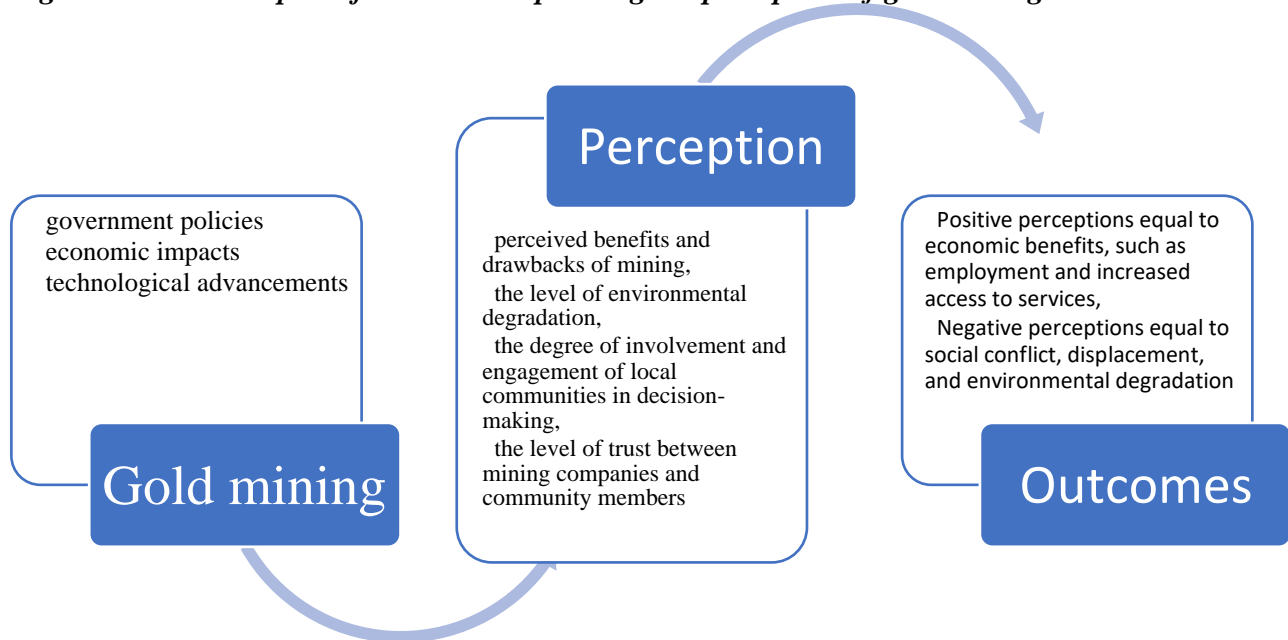
Finally, existing studies have explored the complex dynamics, specifically the potential upsides as well as risks on whether and how to formalize artisanal and small-scale mining (ASM) activities in developing countries. Hilson and Maconachie (2017) argue many past attempts at blanket ASM formalization across sub-Saharan Africa failed due to top-down policymaking lacking nuanced understanding of socioeconomic incentives driving informal mining. They advocate locally attuned approaches enabling gradual formal steps balancing miner interests with added environmental and social protections. Meanwhile, Salas-Urviola et al.'s (2021) study underscores perceived benefits but also barriers for ASM operators in Peru choosing to pursue formalization, including burdensome paperwork, costs and tax schemes less viable for itinerant workers. The authors call for streamlining administrative requirements while expanding technical assistance to make compliance more feasible for under-resourced miners. Finally, Hook's (2019) study in Guyana suggests prescriptive regulatory approaches less amenable to the fluid nature of small-scale mining risk over-criminalizing the sector. The author advocates participatory policymaking channels enabling miners to voice priorities and concerns.

## **2.5 Conceptual framework**

The conceptual framework explaining the perception of gold mining in the Nkwanta Community revolves around several key factors that influence how individuals and groups perceive and interact with gold mining activities. At the core of the framework is the concept of gold mining itself, representing the primary focus of community attention and engagement. One

of the primary influences depicted in the framework is government policies related to mining regulation and governance. These policies play a significant role in shaping the legal and regulatory framework within which mining activities operate, influencing issues such as environmental standards, land rights, and community engagement practices. Government policies can thus have a profound impact on how gold mining is perceived within the community, affecting factors such as trust in regulatory institutions, perceptions of fairness, and overall acceptance of mining activities.

**Figure 1: The conceptual framework explaining the perception of gold mining in Nkwanta.**



*(Source: Author's own conceptualization, 2023)*

Economic incentives also feature prominently in the conceptual framework, reflecting the material benefits and opportunities associated with gold mining. Economic factors such as job creation, income generation, and community development initiatives can significantly influence perceptions of mining within the Nkwanta Community. Positive economic outcomes may lead to greater support for mining activities, while negative economic impacts or disparities in the distribution of benefits may breed resentment and opposition. Technological advancements

represent another key factor shaping perceptions of gold mining in the Nkwanta Community. Advances in mining technology and techniques can impact various aspects of mining operations, including efficiency, safety, and environmental sustainability. Technological innovations may elicit both positive and negative responses from community members, depending on how they perceive the implications for their livelihoods, health, and environment.

The perceptions of mining in these communities can be influenced by a wide range of interrelated factors, such as the perceived economic benefits like employment and infrastructure development versus drawbacks like environmental degradation, as well as the equitable distribution of mining revenues for local development. The level of actual environmental damage from mining operations, including air and water pollution, deforestation, and impacts on biodiversity, can shape community attitudes and perceptions. The degree to which local communities are meaningfully involved by mining companies and government in decision-making through consultations, participatory monitoring, and grievance mechanisms affects perceptions of procedural fairness. The level of trust between community members, mining company representatives and government officials, built through transparent communication and fulfilled commitments, also colors local views.

These factors influencing community perceptions of mining are in turn shaped by broader socio-cultural dynamics, economic incentives, and political power structures. Historical experiences with mining in a region, either positive or negative, create cultural narratives that persist across generations. Economic reliance on agricultural livelihoods, compared to mining wages, shapes cost-benefit calculations. Distribution of authority between local chiefs, district officials and national leaders determines who controls mining approvals and benefits. Access to resources, capital and education mediates who captures mining employment. Gender, class and

ethnic inequalities permeate these dynamics, resulting in differentiated perceptions across social groups.

Community perceptions of gold mining, whether positive or negative, subsequently impact various aspects of local wellbeing and livelihoods. Positive perceptions centered on economic opportunity can enable rising incomes, funded community projects, and expanded services. However, unfulfilled expectations around benefits lead to grievances. Negative perceptions driven by environmental hazards and social disruptions may ignite opposition movements. Loss of traditional livelihoods reduces community resilience. Conflict over mining access can cause displacement and human rights abuses. Health impacts from contamination lower productivity. Overall, this conceptual framework recognizes the multifaceted and complex nature of community perceptions of gold mining. It highlights the need for inclusive decision-making, responsible operations, and equitable benefit sharing to ensure mining activities align with local priorities and foster sustainable development.

## **2.6 Conclusion**

In conclusion, the existing literature provides valuable insights into the complex factors shaping public perceptions of gold mining across contexts, though few studies have focused specifically on the experiences and viewpoints of the Nkwanta Community. The reviewed research reveals a spectrum of perspectives on the socio-economic, cultural, health, and environmental impacts of mining operations, underscoring the heterogeneous distribution of costs, benefits and risks that mining introduces locally. While some studies point to economic opportunities, infrastructure development and rising incomes from mining activities, others spotlight threats of contamination, loss of farmlands, social disruptions, unequal benefit sharing and exclusion from decision-making. This literature signals the need for in-depth investigation of the multifaceted

community perceptions at play in the Nkwanta locality, given its long history of both small-scale and industrial gold mining activities. This is because understanding the specific historical, sociocultural, economic and political dynamics that have shaped attitudes towards mining in Nkwanta can provide valuable insights to guide governance reforms, industry practices and community engagement. This study aims to fill the research gap through an analysis of local perceptions in the Nkwanta Community, to elucidate the complex factors driving acceptance, resistance, aspirations and anxieties tied to gold extraction in the community.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.0 Introduction**

This chapter details the research methodology applied in the study. It presents the research design, population, sample, sampling technique, data collection, and data analysis procedure utilized in explaining the perception of gold mining in the Nkwanta community.

#### **3.1 Research Design**

According to Kothari (2004), research design is a conceptual structure that guides the process of investigation. It serves as the central point for data collection, measurement, and analysis. Research design is the plan and framework for conducting a study, and it plays a critical role in determining how data is collected and analyzed. Essentially, it provides the basis for gathering and analyzing data necessary for answering research questions. Creswell (2014) outlines three fundamental research design approaches, each holding distinct advantages based on a study's aims and questions. Quantitative designs allow testing of hypotheses and assumptions through large-scale numerical data and statistical analysis. As Williams (2007) discusses, techniques like surveys and experiments translated into numerical datasets enable broader examinations of patterns, trends and relationships between precisely measured variables. However, limitations exist in exploring deeper meanings or capturing lived experiences.

This study employed a mixed-methods approach to understand the perception of gold mining in Nkwanta. This method was selected because it allows for data collection at a single point in time using both survey methods and qualitative techniques to capture attitudes, beliefs, and perceptions in a sample population (Jones, 2010). The use of a mixed method is aptly suited to meet the objectives of this study on community perceptions of gold mining. The data was collected

on key variables through a combination of closed and open-ended survey questions. The quantitative data, with its structured nature, provides measurable insights into how the Nkwanta community views gold mining and allows for generalization to the broader population. On the other hand, the qualitative data, gathered through open-ended questions, helps in identifying patterns in thoughts and opinions, thereby shedding light on community perceptions (Creswell, 2014). This mixed-methods approach, combining the strengths of both quantitative and qualitative research, provides a rigorous scientific framework for advancing understanding of community perceptions around mining.

### **3.2 Population, Sampling Technique and Sample Size**

#### **Population**

The term "population" in research serves as a fundamental concept, encapsulating the entirety of individuals, objects, or phenomena that share a specific characteristic relevant to the study. This characteristic could range from demographic traits like age, gender, or occupation to specific experiences, behaviors, or conditions. In the context of this study, the population of interest is delineated with precision. It comprises all individuals residing in the Nkwanta community, situated within the Ashanti region, who meet two key criteria: they must be 18 years of age or older, and they must have direct or indirect involvement or experience with gold mining activities. With the specification, this study seeks to target a distinct subset of the community whose insights, perspectives, and experiences are pertinent to the study's objectives.

The nature and form of gold mining activities in Nkwanta community underscores the relevance and importance of studying this particular population. The Ashanti region, renowned for its rich mineral resources, including gold, serves as a focal point for mining-related research due to its economic, social, and environmental implications. Also, the clear and precise definition of

the population aids in ensuring the validity and reliability of the study findings. It facilitates the selection of appropriate sampling techniques, data collection methods, and analytical approaches tailored to the characteristics and needs of the target population. Moreover, it enables researchers to effectively communicate the scope and applicability of their findings, thereby enhancing the relevance and utility of the study within both academic and practical contexts.

The simple random sampling technique employed in this study is a foundational approach in survey research methodology. It operates on the principle of randomness, wherein each member of the population has an equal probability of being selected for inclusion in the sample. This method ensures that the sample is drawn in an unbiased manner, without any preference or preconceived notions influencing the selection process. One of the key advantages of simple random sampling is its ability to provide a representative sample of the population. This is because by allowing every individual in the population to have an equal chance of being chosen, this method ensures that the characteristics and diversity present in the population are accurately reflected in the sample. This representation is crucial for generalizing the findings of the study back to the broader population with confidence. Moreover, simple random sampling helps guard against various forms of bias that can compromise the validity and reliability of research findings. For example, it mitigates selection bias, where certain subgroups of the population are systematically overrepresented or underrepresented in the sample due to non-random selection methods. Additionally, random sampling reduces the likelihood of researcher bias, as there is no subjective judgment involved in the selection process.

The selection of a sample size is a critical aspect of research design, impacting the study's statistical power, precision, and generalizability of findings. The exact population of the community cannot be verified with official government records. However, Madamfo-ghana.de



advances that the community has 2,100 inhabitants. In this research, a sample of 400 respondents aged 18 years and older, were chosen based on a widely recognized rule of thumb for sample size determination. This rule suggests that a sample size of around 400 is often sufficient to achieve statistical robustness in many research contexts. The rationale behind selecting this specific sample size is multifaceted. First and foremost, a sample size of 400 respondents provides a balance between practical considerations and statistical requirements. It offers a sufficient number of observations to detect meaningful effects or differences within the population while remaining manageable in terms of resources, time, and effort required for data collection and analysis. Moreover, with a sample size of 400, the study aimed to ensure that the sample is adequately representative of the broader population. Thus, by capturing a diverse range of perspectives and experiences, the sample becomes more reflective of the heterogeneity present within the population, thereby enhancing the generalizability of the findings to the larger community of interest.

Four hundred (400) questionnaires were distributed in the communities, with an extra 30 expected to be distributed again to mitigate possible unresponsiveness from the expected 400 respondents. It was noteworthy that the study achieved a high return, with 352 out of the 400 selected respondents completing the survey. A high response rate indicates a high level of engagement and cooperation among the sampled individuals, reducing the likelihood of non-response bias and increasing the representativeness of the final dataset. The substantial return rate also speaks to the effectiveness of the data collection procedures and the clarity and relevance of the survey instrument used in capturing respondents' experiences with gold mining in the Nkwanta community. In short, the final dataset comprising 352 respondents serves as the foundation upon

which subsequent analyses are conducted. The table below details the social demographic characteristics of the sample.

**Table 1: Socio-demographic characteristics of the sample**

<b>Socio-Demographic Characteristics</b>	<b>Frequency</b>	<b>Percent</b>
<b>Gender</b>		
<i>Female</i>	194	55
<i>Male</i>	158	45
<b>Age</b>		
<i>Young (18 to 32)</i>	80	23
<i>Adult (33 to 46)</i>	90	25
<i>Old (47 and above)</i>	182	52
<b>Level of Education</b>		
<i>None</i>	83	23
<i>Primary</i>	88	25
<i>Secondary</i>	77	22
<i>Tertiary</i>	104	30
<b>Employment Status</b>		
<i>Student</i>	38	11
<i>Unemployed</i>	113	32
<i>Employed</i>	188	53
<i>Retired</i>	13	4
<b>Monthly Income</b>		
<i>Less than 1500 cedis</i>	88	25
<i>1500 to 1999 cedis</i>	52	15
<i>2000 to 2499 cedis</i>	82	23
<i>2500 to 3999 cedis</i>	62	18
<i>4000 +</i>	68	19

### **3.3 Data Collection**

The data for this data was primarily collected using the survey approach. Surveys are a widely used research method for gathering data from a sample of individuals to gain insights into their opinions, attitudes, behaviors, and characteristics related to a particular topic of interest. In the context of this study, the survey approach provided a structured means of collecting information from community members regarding their experiences with and perceptions of gold mining in the Nkwanta community. The survey questionnaire was meticulously designed to collect both close-ended and open-ended responses. Quantitative data, obtained through closed-ended questions, are valuable for easy quantification and statistical analysis. These questions are structured in a way that allows respondents to select from predefined response options, facilitating the systematic collection of numerical data on various aspects such as age, income, education level, and attitudes towards gold mining. This quantitative data enables researchers to identify patterns, trends, and associations within the dataset, thereby providing valuable insights into the socio-demographic characteristics and attitudes of the community members.

In addition to closed-ended questions, the survey questionnaire also included open-ended questions. These questions provide respondents with the opportunity to express their views, opinions, and experiences in their own words. The free-form responses from the open-ended questions allowed for the deeper exploration of issues that may not have been covered by the closed-ended questions. Thus, the qualitative data enriches the analysis by capturing the nuances, complexities, and context-specific factors underlying community members' perceptions and experiences related to gold mining. It offers valuable insights into the diverse perspectives and lived experiences of individuals within the community, thereby complementing the quantitative data collected through closed-ended questions. The questionnaire was administered to the selected

sample of community members through face-to-face interviews conducted by trained research assistants. This method of data collection allows for direct interaction between the interviewer and the respondent, facilitating clarification of questions, ensuring comprehension, and enhancing response rates. Moreover, face-to-face interviews enable researchers to establish rapport with respondents, fostering a conducive environment for open and honest communication.

The questionnaire was thoughtfully structured to gather data on several key areas relevant to the research objectives. These areas include socio-demographic characteristics, perceptions of gold mining activities, attitudes towards mining activities in the community, and views and opinions on measures for improving the mining sector in Nkwanta. Each section of the questionnaire served to elucidate different aspects of community members' experiences and perspectives regarding gold mining in the Nkwanta community.

- Socio-demographic characteristics: This section aimed to gather basic demographic information about the respondents. The questions focused on variables such as age, gender, education level, occupation, and income. The variables provide important context for understanding how different demographic groups perceive and are affected by gold mining activities in the community. These socio-demographic characteristics helped identify any patterns or correlations between demographic factors and attitudes towards mining.
- Perception of gold mining activities in the Nkwanta community: This section of the questionnaire focused on capturing respondents' perceptions of various aspects of gold mining in their community. The questions covered topics such as the environmental impact of mining activities, the economic benefits and drawbacks, the social consequences for the community, and overall satisfaction or dissatisfaction with the presence of mining operations.

- Attitudes towards mining activities in the community: This section delved into respondents' attitudes and feelings towards mining activities in the Nkwanta community. The questions explored attitudes towards mining regulations and enforcement, perceptions of the mining industry's role in community development, concerns about health and safety issues related to mining, and general sentiments towards the presence of mining operations in the area.
- Views and opinions on measures for improving the mining sector in Nkwanta: This section sought to gather respondents' suggestions, ideas, and perspectives on potential measures for enhancing the mining sector in their community. The open-ended questions focused on topics such as regulation of gold mining activities as well as initiatives for promoting sustainable mining practices.

The questionnaire was treated to pretesting to ensure its validity and reliability before being administered to the selected sample of community members. This process involved conducting a trial run with a small sample of individuals (n=20) who share similar characteristics with the intended study population. During the pretest, participants were asked to complete the questionnaire under conditions similar to those of the actual survey. This allowed researchers to observe how respondents interpreted and responded to the questions, as well as to identify any difficulties or confusion encountered. Common issues that might arise during pretesting include ambiguous wording, complex or leading questions, or missing response options. The feedback gathered from the pretest participants provided valuable insights into the questionnaire's effectiveness and usability. The study used this feedback to refine and revise the questionnaire as needed, ensuring that it accurately captures the information required to meet the study objectives. This iterative process of testing and refining helped enhance the questionnaire's validity by improving its ability to measure the intended constructs accurately.

### **3.4 Data Analysis**

The data collected from the survey was analyzed using both quantitative and qualitative approaches. Descriptive statistics were utilized to summarize the socio-demographic characteristics of the respondents using measures such as frequency counts and percentages. This provided insights into the demographic composition of the sample. Equally, the Relative Importance Index was employed to examine respondents' perceptions of gold mining in the community. This index allowed for the assessment of the relative importance of different factors or dimensions related to gold mining, enabling researchers to identify the most salient aspects of the perception of community members. In addition, the logistic regression model was utilized to establish the demographic factors explaining opposition to mining operations. This technique facilitated the identification of significant associations between demographic variables (such as age, gender, education level, etc.) and support or opposition to mining, thereby elucidating potential demographic predictors of support or dissent towards mining activities in the community.

In addition to quantitative analyses, the open-ended questions from the survey were subjected to qualitative thematic analysis. This approach involved systematically coding and categorizing respondents' responses to identify recurring themes, patterns, and insights. Through content analysis, researchers were able to uncover the underlying motivations, concerns, and perspectives embedded within the qualitative data. All quantitative analyses were conducted using the R software, a widely used platform for statistical computing and data analysis. The results of the analyses were presented using a combination of tables, illustrating key quantitative findings, and quotes from respondents, providing qualitative context and enriching the interpretation of the results. This integrated presentation approach facilitated a comprehensive understanding of the research findings, catering to both quantitative and qualitative aspects of the data.

### **3.5 Ethical Issues**

This study strictly adhered to all ethical considerations ensuring respect for the rights, autonomy, and dignity of the participants. First, the principle of voluntary participation was strictly adhered to, with participants being clearly informed that their involvement was entirely optional, and they could withdraw at any time without facing any negative repercussions. Another principle adhered to was informed consent, here, the participants were provided with a comprehensive overview of the study, including its purpose, procedures, potential risks and benefits, and how their data will be used and protected. Participants were asked to give their consent to participate after they have understood all this information. Equally, to ensure anonymity, I assigned each participant a unique identifier or code. This code would be used in all data collection and analysis processes, ensuring that the data cannot be directly linked to the individual participant.

In addition, the study adhered to the principles of confidentiality. All collected data would be securely stored in encrypted files or databases. Access to these files would be limited to only those directly involved in the research. Furthermore, any information that could potentially identify a participant would be omitted or sufficiently generalized in the reporting of results. Also, the research's potential to harm the respondents was considered. I conducted a thorough risk assessment prior to the study to identify any potential harm to participants. No risks were identified risks and participants were informed of this during the consent process.

Finally, the research assistants were chosen based on qualifications and suitability for the role, undergoing comprehensive training in ethical research practices. This training covered principles of informed consent, confidentiality, and cultural sensitivity, ensuring that assistants could conduct interviews sensitively and respectfully, particularly when dealing with diverse communities or sensitive topics. Also, regular supervision and support provided assistants with

resources and guidance to address any ethical concerns that arose during data collection. This allowed the study to uphold ethical standards while ensuring the integrity and credibility of the research process.

### **3.6 Reflexivity and Positionality**

Reflecting on my positionality means to become aware of how I position myself in relation to the research and the data (Berger 2013; Pitard 2017). My positionality encompasses not just my personal history and obvious characteristics like color, gender, and education but also my assumptions, prejudices, and early biases. Being a Ghanaian and having been following the stories in the mass media, I heard about recurring physical conflict and unrest between gold miners and majority of people in Nkwanta community because of unsustainable mining practices such as environmental and land dispossessions. Based on this, I developed a forethought that the vast majority of the villagers might oppose mining and the companies activities in the area. However, this turned out to be a stereotypical thinking during the research.

I had to acknowledge that people's perceptions about gold mining in many ways, were contradictory and not coherent with my preconceived notion. Some of the villagers were unhappy about the negative health and environmental impacts of mining but there was no sufficient data which showed that the villagers were in constant physical unrest with the mining company and miners. I was trapped in my own stereotypical and binary thinking, as I had made a wrong assumption. Reflecting on the research process taught me that constant critical reappraisal of my own biases is necessary to grasp the nuanced and complex nature of relationships between the villagers and gold mining. I engaged in this reflection as it was essential to avoid being trapped in my own bias and preconceptions. My engagement in active participation of respondents in the research was key to correcting my preconceived bias and messiness.



Acknowledging this 'messiness', I was guided by Jones and Jenkins 2008 idea about the need to engage in active participation of participants throughout a research process. That the process and outcomes of research participation are highly contextual and cannot be predicted. This gave me an understanding that the respondents or participants whom I researched in Nkwanta have to share their perceptions as their views define the research outcomes and the situations in Nkwanta and not the views of the researcher or an outsider. In addition, as a researcher, it's important to reflect on my personal assumptions, prejudices, and aims to avoid perpetuating power dynamics. Reflecting on different levels of power dynamics was crucial for transparency in the research process, as well as for adjusting expectations and goals. This includes being willing to adapt the research design and also means being open to altering the study design as needed.

### **3.7 Limitations**

One of the key limitations encountered during the data collection was the respondents' initial perception that the survey was a government sponsored activity. This misconception leads to reluctance to participate or provide honest responses, as respondents felt wary of sharing personal opinions about gold mining. The concern about the survey being a government operation is understandable, as respondents may fear potential consequences or repercussions, even if the survey is completely anonymous. This perception can skew the data collected, as respondents may provide biased or incomplete responses to protect themselves. However, this limitation was addressed through a thorough debriefing process. The respondents were informed that the survey was for academic research and not a government or public sector initiative and their responses were going to be treated with the highest ethical standards. After this, many respondents who were initially hesitant may willingly participate in the survey. This shift in attitude can be attributed to the increased trust and understanding of the reason for the data collection.

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.0 Introduction

This chapter highlights the presentation and discussion of the findings of the study. The interpretation and discussion were limited to the objectives of the study and discussed within the context of existing literature.

#### 4.1 The perception of gold mining among the people of Nkwanta

The study sought to analyze perception of gold mining among the people of Nkwanta. The table below presents the relative importance index of respondents' perceptions regarding gold mining, focusing on various dimensions such as public health, economic growth, environmental impact, destruction of livelihood, and social unrest. Each perception category is evaluated based on the percentage of respondents scoring across different levels, ranging from strongly disagree (SD) to strongly agree (SA), with the Relative Importance Index (RII) calculated for each perception. The results provide a significant revelation regarding respondents' perceived impacts of gold mining in the Nkwanta community, offering crucial insights into the overarching concerns and priorities of the community.

**Table 1: Respondents' Perception of Gold mining**

Perception about gold mining	Percentage of Respondents Scoring				RII	Rank
	SD	D	A	SA		
Public health	1	38	60	1	<b>0.673</b>	<b>1</b>
Economic growth	8	33	42	18	<b>0.656</b>	<b>2</b>
Environmental impact	3	39	51	7	<b>0.651</b>	<b>3</b>

Perception about gold mining	Percentage of Respondents Scoring				RII	Rank
	<i>SD</i>	<i>D</i>	<i>A</i>	<i>SA</i>		
<b>Destruction of livelihood</b>	21	29	25	25	<b>0.635</b>	<b>4</b>
<b>Social Unrest</b>	25	23	25	27	<b>0.634</b>	<b>5</b>

*(Source: Author’s own analysis, 2024)*

**4.1.1 Public Health**

The high relative importance index score of 0.673 for public health impacts reflects the Nkwanta community's strong consensus that gold mining activities have severely affected community health. This perception stems from the understanding that invasive mining techniques like excavation, drilling, blasting, and heavy equipment usage can disrupt and contaminate environmental media like air, water and soil, enabling proliferation of diseases. Specifically, regular exposure to contaminated dust and particulate matter from mining sites and ore processing creates respiratory illnesses like asthma, bronchitis, silicosis, and increased susceptibility to pulmonary infections.

The above finding is in agreement with existing scholarly research position. Bawa (2010) and Armah et. al (2013) have argued that gold mining practices in Ghana is characterized by pervasive health implications because many Ghanaian mining communities experience higher respiratory symptoms and illnesses compared to non-mining towns. This health threatening experiences mining communities face is driven by unfriendly environmentally toxic heavy metals and pollutants released into the environment during large mining activities which impact negatively on food chains and healthy drinking water. This, in effect, contributes to chronic ailments like skin lesions, gastrointestinal diseases, and nervous system disorders. In addition,

surface water pollution from mining wastewater discharge and leakage from tailings dams can foster water-borne infections like typhoid, dysentery, cholera and diarrhea. Standing water pools created in abandoned mining pits provide breeding grounds for malaria-spreading mosquitoes, with some studies reporting malaria rates three times higher in mining versus non-mining regions (Adimado & Baah, 2002). The hydrological disruptions that alter water flows and irrigation can further exacerbate malaria risks.

The influxes of migrant mine workers into communities' strain local health services and infrastructure, limiting care access for both miners and community members. The overcrowded temporary housing for miners enables rapid spread of infectious diseases like tuberculosis and sexually transmitted infections. With inadequate health facilities, untreated infections can persist and spread through sexual networks into the broader community. Studies have associated higher rates of teenage pregnancies and maternal health complications with mining regions, as young girls drawn into transactional sexual relationships lack access to reproductive health services (Atuoye et al. 2015).

In the rapid economic transformations and urbanization spurred by gold mining in the community could introduce a host of additional public health challenges beyond the scope of existing community health services. One significant concern is the potential rise in substance abuse, driven by factors such as increased disposable income and social dislocation associated with mining-related urbanization. The availability of substances coupled with social pressures can contribute to higher rates of substance misuse within the community, leading to addiction and associated health complications. Also, the disruption of traditional livelihoods, economic disparities, and social disintegration can contribute to heightened levels of stress, anxiety, and depression among community members.

In short, the combination of direct environmental health hazards together with indirect pressures of mining on services, demographics, and social fabric amplify public health risks and accessibility barriers to care in mining-intensive communities like Nkwanta. Using the social exchange theory, it can be deduced that the Nkwanta community members perceive the costs of gold mining, in terms of the negative health impacts, to outweigh the potential benefits, such as economic opportunities. The strong consensus reflected in the high relative importance index score of 0.673 for public health impacts suggests that the community members feel that the health-related costs of gold mining are significant and unacceptable. This perception is likely shaped by the community's lived experiences with health challenges, the inadequate access to healthcare services, and the broader social and economic disruptions caused by mining activities. The community's dissatisfaction with the public health consequences of gold mining can be seen as a form of social exchange, where the community members feel that the trade-off between the benefits and costs of mining is unfavorable.

#### ***4.1.1.1 Social exchange theory: perception of mining and public health***

Via the lens of social exchange theory, I reflect on the issue of mining and public health struggles shared by the participants. I think gold mining should be viewed through the lens of a relationship between actors (mining industry and the Nkwanta people (public)). From social exchange perspective, mining benefits and harms should occur within exchange relations. Residents in Nkwanta community exchange their resources (gold) with the inspiration of attaining good economic returns and good public health etc. Miners also mine gold to maximize profit. This suggests that each of the actors in the picture of gold mining in Nkwanta has an interest but the accumulation of one's interest should not be a health and livelihood threat to the other. However, the data from the field says otherwise. Homans (1958) on social exchange theory asserted that

social behavior is determined by the perceived balance of costs and rewards in relationships, with individuals engaging in social interactions that they perceive will lead to the greatest reward. From the data emerging from the Nkwanta community, mining practices are eroding public health and safety due to environmentally unsustainable mining practices via toxic chemical spills etc. This is in contrast with their initial expectations of the people of Nkwanta entering a social relation for reward and not only a cost.

Gold mining is both an economic and social activity and actors involved in mining engages in social relation. Hence a good and sustained public health in Nkwanta must be considered as an essential resource particularly when viewed within a context of a mining community where access to proper health care is uneasy. This means any unsustainable mining practices, conscious or unconscious, that threatens public health and safety is a cost to the people and the community. From such reflection, it can be argued that gold mining in Nkwanta generates cost instead of reward and these costly mining experiences arise from the daily social exchanges between miners and mining community. This analysis therefore rings a bell that social exchange relations emerging from mining exchanges provide more clearer and meaningful information for mining communities, policy makers and researchers interested in understanding the harms residents go through under gold mining projects. It also brings to awareness that social exchange relations depend not only on the rewards but also on the costs, or more specifically, the relation between these, as this is what determines the benefits of the social exchange relation for individuals or communities (Blau, 1986).

#### ***4.1.2 Economic growth***

The relatively high RII score of 0.656 for positive economic impacts reflects the Nkwanta community's recognition of tangible benefits from local gold mining activities, especially

increased employment and incomes. This perception likely stems from reliance on mining-related jobs and revenue in an area with constrained livelihood options. Several studies corroborate that mining provides crucial economic opportunities in rural Ghanaian communities. At the national level, Ghana's extractive industry has been a key driver of GDP growth, foreign investment, and government revenues (Bloch & Owusu, 2012). Locally, artisanal and small-scale gold mining has created vital jobs and income in communities near industrial mines. Research by Garvin et al. (2009) around Tarkwa described mining as the primary occupation for the majority of respondents, underscoring its dominance in local economies. In rural towns lacking alternative industries, small-scale mining provides livelihoods for unskilled workers.

Beyond direct employment, mining operations also stimulate wider economic multipliers in host communities via supply chains, support services, and induced commercial activity. Aubynn (2009) highlighted extensive economic linkages surrounding mines often overlooked, including local businesses supplying food, equipment, transport, construction, and technical services to mining companies. This spurs job creation across multiple sectors as community enterprises emerge to meet mining demand. At the household level, mining incomes get spent locally, energizing markets for consumer goods and services. Infrastructure development is another recognized economic benefit, as mining companies often construct roads, electrification, water systems, health clinics, and schools in surrounding communities per contractual social investment obligations. Hilson and Murck (2000) documented substantially improved transportation networks, water access, health services, and education institutions around some Ghanaian mines resulting from such corporate community development projects.

The prioritization of health and environmental impacts over economic gains within mining communities underscores a recognition of the trade-offs inherent in mining activities. While

mining can provide economic stimulus, communities often perceive the negative effects on public health, water resources, and agricultural livelihoods as outweighing the income benefits. This sentiment is consistent with the findings of Lawson and Bentil (2014), who observed persistent community dissatisfaction and grievances surrounding Ghanaian mines, despite the job creation and infrastructure contributions they bring. One contributing factor to this discrepancy is the limited trickle-down effect of mining activities in terms of jobs and revenues within local communities. Many mining operations rely on external migrant labor and centralized structures, which restrict local employment opportunities and economic linkages. Additionally, the capital-intensive nature of mining means that it provides limited employment relative to its economic scale.

Moreover, issues of revenue mismanagement further exacerbate the situation, as local government corruption and the misuse of mining revenues and royalties can prevent communities from realizing the full benefits of mining activities. This, coupled with a focus on physical infrastructure investments over critical social services like health and education, leaves communities underserved and discontented. The cyclical nature of mining operations, characterized by boom-bust cycles and eventual closures, also contributes to community challenges. Post-mining, communities often face significant economic transitions and job losses, leading to social and economic upheaval. Furthermore, mining activities tend to concentrate wealth, resulting in income inequality within communities where only the elite benefit substantially, further widening the gap between the haves and have-nots. Finally, the social fabric of communities is also strained by mining activities, as economic changes such as subsistence loss, increased living costs, and wealth disparities can lead to social dysfunction.



In short, gold mining can be viewed as a complex system that involves multiple interconnected components, including economic, social, environmental, and health-related factors. The findings suggest that while the people of Nkwanta acknowledge and depend on the economic benefits of mining, they perceive substantial costs in terms of public health, environment, livelihoods, and social cohesion. The economic benefits of gold mining, such as increased employment, incomes, and infrastructure development, are recognized by the Nkwanta community. These positive economic impacts can have ripple effects throughout the local economy, stimulating wider economic multipliers through supply chains, support services, and induced commercial activity. This aligns with the findings of studies that have documented the economic linkages and job creation surrounding mining operations in Ghanaian communities. However, the popular concern about health and environmental problems over economic gains within the Nkwanta community indicates that the community members regard the negative effects of mining as outweighing the economic benefits.

#### ***4.1.2.1 Social exchange theory: perception of mining and economic growth***

Social exchange is conceived by Homans as “the exchange of activity, tangible or intangible, and more or less rewarding or costly, between at least two parties” (Homans, 1961, p. 13). Stated differently, the exchange can be interpreted as a process wherein “actors” provide valuable resources to each other. Social exchange can be crucial to social interactions that underpin group relationships (Blau, 1964) . A collective or group that functions as a single entity, like the mining industry or the public, is referred to as an “actor.” In the context of this analysis, the actors are the mining company and the public; people of Nkwanta.

By using the social exchange framework to examine perception on economic growth, the participants perception about mining activity is characterized by both costs and benefits. Although

they think that mining activities help in terms of job creation in the community, these jobs are occupied by external migrants who have advanced skillset than the local people. The local public hear of the availability of jobs in the mines, but they have limited human resource capacity (skills) to compete for the jobs provided by the mines. Those who often work in the mines are the highly educated, elites. A limited opportunity is given to the locals (people of Nkwanta), a situation that is generating a community of haves and have nots. The privileged, external migrants with advanced education in mining related jobs such as engineering are getting richer while the disadvantaged villagers who are getting poorer.

This, in effect, widens both income and gender disparity gaps as many of the workers in the mines are males. Despite this visible disparities, some women in the village have tapped into a small window of opportunity to sell basic food items and mining equipment to the miners, and the now growing population is inspired by mining activities in the area and this is helping the local people who have entered into the service industry. This, in some way contributes to some economic growth, social and economic well-being. However, negative concerns with mining (including public health struggles, environmental destruction etc, income disparity and dispossession of traditional means of subsistence (farming and trading) are of popular concern. This demonstrates the intricate and frequently conflicting dynamics inside the gold mining industry, where the pursuit of economic gain may come at the expense of environmental sustainability and public health advantages.

The social exchange theory states that an individual's assessment of the benefits that mining activities provide to society will determine how they feel about them and how much they are accepted (Zhang & Moffat, 2015). The people of Nkwanta assessment of mining are based on social interaction. In other words, they assess mining development based on the cost and benefit

that arise from them. Positive perceptions of mining will only emerge when benefits exceed cost. There is adequate justification for the public to tolerate and have a positive perception of mining activities as long as benefits are seen to exceed the cost. On the other side, public positive perception for mining development is likely to decline due to more negative attitudes when mining activities have effects that negatively affect both individual and society wellbeing and the public believes that these costs outweigh the benefits. In the most extreme case, the public's opposition to mining operations may even lead to the termination of the exchange relationship. In the case of Nkwanta community, there is no direct or clear visible opposition to mining operations but it is clear from the data and the above discussion that the negative cost of mining development outweighs the benefits in the space of social exchange.

#### ***4.1.3 Environmental Impact***

The lower relative importance index score of 0.651 for general environmental impacts compared to health and economic effects provides insight into the Nkwanta community's nuanced perspectives and priorities regarding gold mining consequences. This score indicates recognition of environmental damage like deforestation, soil degradation, and pollution from mining activities. However, these impacts were not perceived as acutely as the immediate social and health effects with direct repercussions on daily community life. However, the slightly lower prioritization of ecological impacts should not be interpreted as lack of concern regarding mining's potential devastating environmental effects. Rather, it likely reflects recognition that many environmental repercussions manifest gradually over time, compared to the rapid community health and economic transformations induced by mining operations. Deforestation, biodiversity losses, soil erosion, water contamination and wildlife disruptions represent long-term, cumulative impacts that may not be immediately visible or linked directly to mining by community members.

These environmental consequences are well documented in literature on gold mining in Ghana. Studies by Akabzaa and Darimani (2001) around rural mines found substantial destruction of forests, agricultural lands and water resources, with the authors concluding mining had caused "massive environmental degradation". Equally, Serfor-Armah et al. (2006) described elevated levels of arsenic, cadmium and other metals in soils near active mining resulting from pollution by mine wastes. The catastrophic failure of a tailings dam at the Ahafo mine in 2009 released high levels of arsenic and heavy metals into local streams, underscoring the massive yet hidden liabilities of environmental contamination that persist long after mine closure (Armah et al. 2012). Similar legacy pollution likely affects Nkwanta from decades of intensive small-scale and industrial gold mining nearby.

While less visible than immediate health impacts, these lingering environmental damages can profoundly affect community health, economy, culture and sustainability over generations. Deforestation and habitat destruction threatens medicinal plants, wild foods, timber and other non-timber forest products relied on by communities. Loss of farmland and reduced agricultural productivity from chemical contamination, landscape disruption and water scarcity threatens food security and incomes. Pollution of surface and groundwater resources increases risks of water-borne illnesses while also limiting clean water availability. Mercury contamination from artisanal mining accumulates through food chains, leading to neurological disorders. Additionally, environmental harm represents damage to community identity and spirituality rooted in connections to ancestral lands and nature. Sacred forests, streams and wildlife that hold deep cultural meaning for indigenous communities are degraded by mining pollution, noise, infrastructure and influxes of outsiders.

Thus, while Nkwanta residents may rank immediate health and economic impacts higher based on visible everyday experience, these interlinked environmental effects cannot be discounted, as they silently but substantially impact public health, livelihoods, and community sustainability over the long-term. The lower environmental score may also reflect successful corporate social responsibility efforts by mining companies to manage visible pollution and land disturbance through remediation. However, legacies of chemical contamination, biodiversity loss, and deforestation may persist regardless of mitigation. The findings suggest that community members recognize the invisible yet pervasive nature of ecological mining damage, rather than lack of community concern. The communities members seem to have established a trade-off for the immediate gains of jobs and incomes for the hidden liabilities of long-term environmental degradation that threaten the environment due to the gold mining.

#### ***4.1.3.1 Social exchange theory: Understanding environmental impacts of gold mining***

The scientific community's challenge is to translate increased understanding of the workings of the world to the citizenry in a way that engages and inspires them to modify their behaviors as necessary to protect and preserve the sustainability of the environment. Using the exchange theory to reflect on the environmental complexities with mining at Nkwanta community, I engage in a brief discourse on what Blau (1986) described as power differentials in the relationship between exchanging entities. At first look, it would seem that nature holds power since it provides humanity with a wealth of resources. But in social exchanges with nature, humans possess a plethora of material and intellectual resources, and they are always willing to use them to maximise gains and minimise losses. Nature is asked to do a lot of work in exchange for little or nothing in return in an uneven exchange. If this is correct, then there is no longer a social interaction between humans and nature. Instead, the mining industry which is driven by humans

engages in a one-way process of obtaining products and services, depriving nature of any advantages during the process.

According to social exchange theory (SET), this is the unequal distribution of benefits across positions in a social network due to the relative use of power (Cook & Rice, 2006). If left uncontrolled, people may appear to be in a better position than nature in terms of taking benefits rather than giving them, but nature may eventually run out of resources to provide and stop participating in the exchange. If, however, we humans come to our senses and recognise our dependence on nature for environmental services, and also recognise that nature ultimately holds the power in the relationship, and that even with human innovation and technological advances in gold mining, we cannot adequately replicate nature's complex systems, then we humans might be persuaded to participate in a more equitable social exchange with nature—a mutually beneficial, reciprocal exchange in which power, costs, and benefits are balanced, and both sides (humans and nature, the environment in Nkwanta) receive something from the relationship.

I therefore make an argument here that gold mining activities in Nkwanta is not just a power contest between the mining companies and the people in Nkwanta but also a power contest between humans and the environment. Hence, in a discourse on social exchange and mining, it is my humble position that the relationship between humans and the environment should not be a one-way relationship where humans exploit the environment for only mankind's benefit but rather a two-way relationship between humankind and nature. Consequently, this understanding, I believe through a social exchange perspective would be fundamental to constructing and building a healthier and more sustainable human/nature relationship via which environmental sustainability could be achieved at Nkwanta mining community.

#### ***4.1.4 Destruction of livelihoods***

The relative importance index score of 0.635 for destruction of livelihoods, especially farming, highlights significant concerns within Nkwanta regarding mining's disruptive effects on traditional income sources and productive land assets. This perception likely stems from direct experiences with loss of farmland, reduced agricultural productivity, and inadequate compensation that have imposed hardship and grief over severed bonds with appropriated ancestral lands that hold deep social and cultural meaning. Several dynamics contribute to mining's disruption of agricultural livelihoods. The construction of mine infrastructure can physically displace farms, while blasting, equipment noise, and dust may hamper cultivation. Also, the pollution from mining can reduce soil fertility and irrigated water quality, lowering crop yields. Equally, the influxes of migrant mine workers can drive up local food prices, while loss of farming income reduces community purchasing power.

Studies across Ghana have corroborated these disruptive impacts of mining on rural livelihoods. Surveys by Akabzaa and Darimani (2001) found most respondents near mine sites reporting loss of farmland and crops to encroaching mining activity. Critically, many affected people indicated receiving insufficient or zero compensation for seized assets, resulting in lasting income loss and social marginalization. Around the Ahafo gold mine, over 7500 acres of smallholder farmland was appropriated for the mine site and associated development, with displaced farmers struggling to restore livelihoods post-relocation despite legal provisions mandating compensation (Asiedu 2013). At the individual level, farmers interviewed by Garvin et al. (2009) described profound personal impacts from lost farmland including income loss, food insecurity, anxiety and a sense of injustice, even when some compensation was provided. Beyond economic effects, disruption of ancestral farmlands severs community ties to the land holding deep

social, cultural and spiritual meaning. Farming represents intergenerational knowledge, identity and community heritage, with certain lands holding sacred value. Even well-compensated resettlement ruptures these place-based connections and relationships fundamental to rural social cohesion.

This is because while necessary for mining development, involuntary resettlement imposes risks of impoverishment if improperly managed. The failure to adequately restore livelihoods following resettlement can have immediate effects, including income loss, unemployment, homelessness, food insecurity, and increased morbidity and mortality. Beyond these immediate challenges, the long-term prosperity of individuals and communities is also at stake, as productive assets erode, social institutions and support networks dismantle, and access to essential community resources diminishes. In the context of resettled farmers around Ghanaian mines, several factors contribute to the precarious situation they face. Firstly, insufficient financial compensation for lands seized, often undervalued by mining companies, leaves farmers at a disadvantage from the outset. Payment delays further compound the issue, with funds not received until long after relocation, prolonging financial strain and uncertainty for affected individuals. Moreover, the limited alternative farmland exacerbates the challenges faced by resettled farmers, with sites often lacking essential resources such as irrigation, nutrients, or sufficient space for productive agriculture. This limitation hampers farmers' ability to sustain their livelihoods and generate income in their new environment.

Equally, the loss of complementary income sources, such as forest foraging and timber harvesting, further adds to the economic strain on resettled farmers, reducing their avenues for generating income and supporting their families. Additionally, the limited availability of alternative employment options, coupled with a lack of skills required for jobs within the mining



sector, leaves many displaced farmers with few viable opportunities for sustainable livelihoods. The displacement of farmers to unfamiliar locales results in the loss of agricultural knowledge and ecosystems that are crucial for successful farming practices. This disruption further impedes farmers' ability to rebuild their livelihoods and adapt to their new surroundings effectively. Furthermore, the fragmentation of communities across multiple resettlement sites leads to a decline in social capital, as established networks and relationships are disrupted. This loss of social cohesion can isolate individuals and hinder collective efforts to address challenges and rebuild livelihoods. The increased costs of living near mines without corresponding income from mining activities place additional strain on resettled farmers, exacerbating their financial vulnerability and insecurity.

Finally, the failure to restore livelihoods has immediate effects of income loss, unemployment, homelessness, food insecurity, and increased morbidity and mortality. It also threatens long-term prosperity by eroding productive assets, dismantling social institutions and support networks, and diminishing access to community resources that provide security. The finding suggests that there are concerns within the community about mining's disruption of traditional farming livelihoods through loss of farmland, reduced productivity, and inadequate compensation. This necessitates a need for responsible resettlement practices that provide fair compensation, productive alternative assets, supplemental income sources, skills training, strong social support networks, affordable housing, and transition assistance. The onus is on mining companies to equitably engage with communities during resettlement planning and implementation to mitigate impoverishment risks.

#### ***4.1.5 Social Unrest***

The relatively low relative importance index score of 0.634 for social problems like crime and unrest implies gold mining activities are not perceived as strongly linked to rising conflict or criminality in Nkwanta. Rather than indicating low concern, this likely reflects the community's nuanced perspective that other complex dynamics beyond mining substantially influence these social issues. Additionally, Nkwanta's overall social resilience and cohesion may help mitigate potential unrest caused by mining disruptions. Strong kinship ties, support systems and community institutions can buffer external stressors. Corporate social responsibility projects funded by mining companies to alleviate inequality and improve community welfare may also reduce tensions.

However, the lack of association of mining with crime or unrest seems incongruent with some literature on "resource curse" social dynamics in mining communities. Studies in rural Tanzania described escalating robbery, prostitution and alcoholism with the influx of high-income miners raising local aspirations for wealth (Kitula 2005). Similar social disruption has occurred around Ghanaian mines, with school dropouts, drug use and teenage pregnancy increasing as youth pursue illegal mining for income (Sarfo-Mensah, Adjaloo & Donkor, 2010). These experiences lend credence to the "resource curse" theory that mineral wealth fuels corruption, conflict and institutional dysfunction in developing countries as factions compete for control. But Nkwanta residents do not perceive this strong linkage between mining and criminality, prioritizing health, economic and environmental impacts over social effects. This underscores the importance of localized perspectives, as broader resource curse narratives may not reflect on-the-ground community realities shaped by multiple mediating factors.

The perceived weak association between mining and crime or unrest in Nkwanta can be attributed to several key dynamics within the community. Firstly, the presence of strong kinship

institutions and support networks plays a significant role in fostering community cohesion and resilience against disruptive influences. These networks provide a foundation of social support that helps mitigate tensions and maintain stability within the community. Moreover, proactive efforts by mining companies to invest in projects that improve welfare, infrastructure, and economic opportunities can help reduce inequality and address sources of potential tension. By contributing to the overall development and well-being of the community, these initiatives contribute to a more harmonious social environment. The economic benefits and job creation stemming from mining operations also play a crucial role in providing local youth with alternative sources of income, thereby reducing the likelihood of engaging in illegal activities. This economic empowerment offers opportunities for sustainable livelihoods and contributes to the overall stability of the community. Furthermore, social conservatism and preservation of cultural values in the rural community act as a protective factor against the introduction of vices such as substance abuse and prostitution. By upholding traditional values and norms, the community maintains a sense of order and moral integrity that can help deter criminal behavior.

As mining activities continue near Ghanaian mines, new dynamics may emerge over time that could impact the surrounding communities. One potential concern is the risk of youth dropping out of school and turning to illegal artisanal mining or engaging in criminal activities (Sarfo-Mensah et al., 2010; Osei, Yeboah, Kumi & Antoh, 2021). This shift in behavior may be influenced by growing income inequality within the community, as young individuals seek alternative sources of income. Furthermore, the in-migration of job seekers and entrepreneurs from outside the community could introduce social vices such as drugs, transactional sex work, gambling, and alcohol abuse. The influx of external individuals may bring with them behaviors and practices that are not aligned with the existing social norms, potentially leading to social tensions and challenges

within the community. Additionally, the loss of communal land and resources to the expansion of mining activities may trigger inter-communal or inter-ethnic conflicts over scarcity. As mining growth encroaches on traditional lands and resources, disputes over access and ownership could arise, straining relationships between different groups within the community.

Finally, frustrations stemming from the lack of local employment opportunities and economic benefits from capital-intensive mining operations may provoke protests and civil unrest. Studies suggest that mining operations can indeed lead to civil unrest, particularly when local communities feel they are not benefiting from the resources extracted from their lands (Matebesi & Twala, 2023; Oh, Shin & Ho, 2023). In Nkwanta, the disparity between the promises of development and the actual distribution of benefits can fuel discontent among community members, leading to social unrest and challenges to the status quo. These emerging dynamics underscore the importance of proactive and inclusive approaches to managing the impacts of mining activities on surrounding communities. In short, while mining may not be currently perceived as increasing Nkwanta's vulnerability to social unrest, the community cannot disregard the risks. Caution is warranted along with proactive efforts to preserve social cohesion, provide opportunity to youth, share profits equitably, and plan collaboratively with companies to mitigate conflict. The lower ranking indicates social impacts are not yet visible, not that they are impossible. Thus, responsible mining practices are vital to ensuring economic development and community wellbeing advance hand-in-hand.

#### **4.2 The demographic factors influencing support or opposition of mining practices.**

This section presents the results of the logistic regression which sought to establish the factors driving individuals decisions to support or oppose the development of new mines in the Nkwanta community. The dependent variable: opposition to mining operations was regressed with

socio-demographic variables: age; gender; age; level of education; employment status and annual income.

**Table 2: Demographic factors influencing opposition to mining operations in Nkwanta**

*Dependent variable:*

	<b>Opposition to mining operations</b>
Intercept	-1.56*** (0.51)
Age	0.20 (0.15)
Female	0.22 (0.23)
Education: Primary	0.54* (0.32)
Education: Secondary	-0.19 (0.34)
Education: Tertiary	0.81*** (0.31)
Occupation: Retired	-0.35 (0.39)
Occupation: Student	0.30 (0.62)
Occupation: Employed	0.16 (0.25)
Annual Income	0.13* (0.08)
Observations	352
Log Likelihood	-232.50
Akaike Inf. Crit.	485.01

*Note:*

\* p<0.1; \*\* p<0.05; \*\*\* p<0.01

The model shows that education level and annual income are significant demographic predictors of resistance to local mining activity. Specifically, having only a primary or tertiary education significantly increases the likelihood of opposing mining operations, compared to having no formal education. The results indicate that individuals with primary education are 54% more likely to resist mining compared to the baseline uneducated group. Additionally, the results showed that highly educated respondents are 81% more likely to resist mining compared to those with no formal schooling. This suggests that those with the least formal education tend to view mining most unfavorably, perhaps due to concerns over impacts on traditional livelihoods and rural communities. For annual income, the results showed that higher household earnings are associated with greater likelihood of resisting mining, specifically, a 1 unit increase in income raises the odds of opposing mining by 13%. This suggests that wealthier sections of the community express greater objection to mining projects locally, implying that financially secure individuals emphasize quality of life over economic gains.

While education level and income emerged as significant predictors, other demographic factors like gender, age, and occupation did not have statistically significant effects on likelihood of resisting local mining operations. The results showed that women were more inclined to oppose mining than men, but this effect was not significant. This suggests that gender is not a determinant factor in views on mining in this context. Similarly, higher age was associated with greater odds of objecting to mining, but this trend was also non-significant. Older residents do not seem to view mining more negatively compared to younger community members. Finally, none of the occupational categories : student, retired, or employed - displayed significantly different odds of opposing mining compared to the unemployed reference group. This implies views on mining activity do not reliably differ based on one's occupation or employment status.

#### ***4.2.1 Education and opposition to mining***

The finding that higher education levels correlate with greater opposition to mining projects reflects the power of education to shape how individuals evaluate and prioritize costs and benefits. This result spotlights several interconnected social dynamics stemming from education's impacts on awareness, critical analysis skills, values formation, and conceptions of time horizons and quality of life. Firstly, the role of education in shaping individuals' perceptions and prioritization of the costs and benefits of mining projects is well-documented in the literature. Studies have shown that higher levels of education are often associated with greater environmental awareness, concern, and support for sustainable practices (Haller & Hadler, 2008; Xiao & McCright, 2015). One key mechanism through which education influences environmental attitudes is the development of critical thinking and analytical skills. Higher education provides individuals with the tools to rigorously investigate the multifaceted impacts of mining, moving beyond simplistic causal narratives and considering long-term, indirect effects. This aligns with research demonstrating that education fosters systems thinking, scientific literacy, and the ability to critically evaluate complex information (Biasutti & Frate, 2017; Kollmuss & Agyeman, 2002). These analytic capabilities empower educated individuals to probe beyond superficial promises to underlying trade-offs.

Secondly, education expands time perspectives with a fuller consideration of long-term, indirect effects alongside immediate gains and losses. Schooling highlights how human systems intrinsically interconnect with surrounding ecosystems and social fabrics over generations. Educated residents may thereby weigh long-term risks of water pollution, biodiversity loss, and cultural disruption on par with temporary jobs and royalties. They apply foresight to avoiding outcomes that could permanently damage community viability. Equally, literacy in civics, ethics,

and environmental humanities develops values prioritizing quality of life, cultural continuity, ecosystem health, and the intrinsic worth of nature. Higher learning nurtures appreciation for the irreplaceable social and ecological attributes that impart meaning and identity. These realities cannot be reducible to economic measurements, overriding transient financial outputs.

In addition, for individuals with advanced education and incomes, basic needs are often already assured. Financial security provides freedom to emphasize lifestyle values like clean air and water over maximizing income. The privilege of comfortable means liberates more room for noneconomic priorities to shape attitudes on issues like mining. Conversely, those with the least schooling and income are frequently most dependent on the land and most vulnerable to disruptions. Uneven development means they must focus urgently on tangible livelihood impacts related to jobs, compensation, and agricultural productivity. This implies that education level correlates with divergent rubrics for weighing costs against benefits. For instance, the uneducated farmer sees threats to imminent sustenance. The professor applies interdisciplinary analysis privileging cultural tradition. Both are rational within different life circumstances. In short, the finding reveals how education shapes worldviews and analytic paradigms, not just technical skills. This means that policymaking must account for these profound influences on attitudes and values.

#### ***4.2.2 Income and opposition to mining***

The finding that higher incomes correlate with greater resistance to local mining reveals how personal economic security shapes perceptions of risks versus benefits. On the surface, opposition from wealthier communities seems counterintuitive - why reject an industry bringing investment and jobs? However, deeper examination suggests logical reasons for this divergence tied to how financial means influence cost-benefit calculations and civic engagement. Most simply, wealth provides flexibility to prioritize quality of life preferences - like clean air and intact



ecosystems - over maximizing economic returns. When basic needs are already met, values beyond financial necessity have space to shape attitudes on mining's trade-offs. The privilege of comfort liberates room to emphasize amenities like recreation and aesthetics. This aligns with research that has found a positive relationship between socioeconomic status and environmental concern (Franzen & Vogl, 2013; Gifford & Nilsson, 2014). When basic needs are already met, individuals can shift their focus to post-materialist values, such as the intrinsic worth of nature and the preservation of cultural heritage (Inglehart, 1995).

Relatedly, higher incomes are associated with having more to lose if mining degrades local environmental and social capital. Wealthy communities often invest heavily in amenities like schools, parks, and conservation lands that rely on sustaining their surroundings. Property values also rise with scarcity and desirability of perceived high-quality communities, so environmental disruptions become personal financial liabilities. Defending these existing assets motivates resistance. Additionally, higher incomes enable easier absorption of mining's impacts without dependence on its jobs. Economic security buffers changes in employment availability. In contrast, low-income communities can be more vulnerable to disruptions, making mining employment a survival necessity that supersedes other concerns. This reflects the literature on the disproportionate burden of environmental degradation and the limited options available to marginalized communities (Agyeman, Schlosberg, Craven & Matthews, 2016).

At the same time, comfort and security allow greater focus on intangible assets like sense of place, heritage, and continuity. Change becomes more disruptive when basic needs are assured. In poor communities, immediate livelihood impacts understandably dominate attention. These attitudes crosscut income groups. Priorities like environmental protection and economic security are widely shared human values. However, the relative weighting of factors and assessment of

trade-offs differentiate based on resources and dependence. Thus, addressing root inequities also remains vital so communities need not accept false dichotomies. Investing mining revenues into education, new industries, and community assets like schools and clinics helps ease difficult trade-offs. The results show that in Nkwanta there is a multiplicity within public attitudes toward mining. While simplified narratives of "jobs versus environment" persist, perspectives are far richer and more nuanced. Thus, appreciating the many factors shaping public perceptions across groups, compromise solutions can emerge that align economic development and environmental stewardship to serve shared prosperity, health, and happiness for generations to come.

#### ***4.2.3 Age, Gender, and occupation vs opposition to mining***

The finding that age, gender, and occupation lacked statistically significant effects on mining perspectives in Nkwanta provides important nuance. Though sometimes assumed to be key demographic predictors, these attributes did not strongly differentiate attitudes in this case once education and income were accounted for. Regarding age, the common narrative might expect younger residents to be more receptive to economic development and older residents to resist community changes. However, the non-significant coefficient suggests these generational stereotypes do not cleanly apply. In Nkwanta, education level and income security likely better explain variation in attitudes than age alone. Unique local social dynamics may render broad age-based generalizations invalid.

Likewise, gender as an isolated variable did not substantially sway mining perspectives once intersections with income, employment status, education level and other identity factors were considered. The common trope of women being more environmentally inclined while men prioritize jobs oversimplifies complex realities. In truth, mining affects all genders and occupations via income, amenities, cultural fabric, and environmental services. Resistance arises across groups

when threats are perceived. Universal human values like economic security, family wellbeing, and environmental health supersede gendered generalizations.

Finally, employed status did not significantly predict attitudes, perhaps because mining provides jobs across diverse occupations from services to construction to transportation. Resistance is not concentrated in any one sector. Moreover, the fact that unemployment did not sway views shows that resistance often arises despite, not due to, economic hardship when core values appear jeopardized. This implies that though material conditions shape perspectives, values like culture, environmental conservatism evade narrow economic gains.

### **4.3 The measures to improve the mining sector in Nkwanta.**

This section highlights the key measures proposed by the respondents on how to improve the mining sector in Nkwanta.

#### ***4.3.1 Strengthening Regulations and Enforcement***

The respondent responses reveal a common theme around the need for the government to strengthen mining regulations and enforcement. Many respondents expressed concerns about lack of compliance, accountability, and oversight in the current regulatory system.

As one respondent explained:

*"The government urgently needs to increase the monitoring and auditing of mining activities to ensure companies are following environmental and safety regulations. Right now, it seems like the government agencies are understaffed and ill-equipped to provide adequate oversight. There are just too few inspectors relative to the scale of mining operations. Routine, unannounced inspections need to become standard practice."*

This perspective aligns with research by Andrew (2021) who analyzed compliance rates in the Ghanaian mining sector. The author found that fewer than half of the active mine sites had been inspected in the past year, and over 75% of companies reported they had experienced no inspections at all. Without consistent monitoring and enforcement, regulations become mere suggestions that companies can ignore with impunity.

Many responses also focused on the need for stricter penalties for violations as a deterrent. Another respondent explained:

*"The fines and sanctions for breaking environmental and mining regulations are so low that companies see them as just a routine cost of doing business. They can make more money by ignoring the rules and paying the small penalties if caught. There need to be much higher fines and serious consequences like suspending operations or revoking permits for repeat offenders. That's the only way companies will take the laws seriously."*

This reflects an important challenge in Ghana's mining sector, where penalties are often inadequate to compel compliance. It is argued that higher fines and enforcement capacity are needed to properly incentivize responsible mining practices.

Finally, several responses emphasized the need to mandate and enforce reclamation requirements:

*"Too many mining sites are simply abandoned once ore deposits are exhausted, leaving behind environmental damage. Reclamation standards need to be established and companies are required to post financial bonds upfront to guarantee funds for rehabilitation. The government has to inspect sites during operations and after to ensure reclamation plans are implemented. Far too many communities are left dealing with degraded land and water."*

The calls from the residents of Nkwanta for more stringent government oversight and intervention regarding mining operations reflect deeply held anxieties within the community. There are widespread fears that without robust regulations and enforcement mechanisms, mining companies may disregard their duty of care and engage in practices that could endanger public and environmental health. These concerns likely stem from past experiences and a general distrust of profit-driven corporations that often prioritize financial gains over societal and ecological wellbeing. The community remembers instances when assurances were made but later broken, and commemorates the enduring scars left behind. They worry that promises to adhere to environmental standards and rehabilitate sites will be similarly empty this time around.

In addition to these doubts is an imbalance of power that leaves the community feeling voiceless and vulnerable. As relatively small settlements, they lack the political and economic leverage to compel mining companies operating in their vicinity to act responsibly. They have witnessed how easily their protests and pleas can be dismissed or ignored entirely by powerful corporate interests. This reinforces the sentiment that the government must step in as their advocate. More specifically, residents urgently demand rigorous monitoring and enforcement of environmental regulations pertaining to issues like water pollution, soil contamination, air quality, and waste disposal. They want regular government inspections of mining facilities and operations to ensure compliance. Additionally, they call for substantial penalties when violations occur, rather than mere slaps on the wrist that fail to change behaviors. The penalties should act as an economic deterrent, making non-compliance prohibitively costly for companies.

Likewise, locals want firm government oversight of reclamation efforts once mining activities conclude. They have seen sites abandoned without proper ecological restoration, leaving behind long-term damage. The community wants the government to compel mining companies to

follow through on rehabilitation plans, meeting clearly defined standards and metrics before being released from obligations. No loopholes or cut corners should be allowed. The desired outcome is environmentally sustainable and socially responsible mining practiced under tight government supervision. The Nkwanta community remains open to economic development and cooperation with mining firms so long as their homes and livelihoods are protected through stringent regulations that are consistently and fairly enforced. They believe both objectives - mining and environmental stewardship - are achievable if the government makes itself an assertive guardian against negligent and exploitative industry practices.

At the heart of the community's demands is a plea for good governance that prioritizes public welfare and ecological health over private profits. They ask that government see itself as a steward for all its citizens, including marginalized communities. Concrete, proactive steps must be taken to earn public trust, prove commitments through action, and ensure vulnerable populations have a powerful ally. Only then can mining proceed in a way that empowers rather than endangers communities. The residents of Nkwanta understand reasonable mining practices will still incur some costs. However, they believe those costs become unjustifiable and unacceptable without sufficient safety measures, mitigation strategies, and reclamation plans in place. Hence the call for the government to be stringent regarding enforcement. A few powerful companies may complain, but the populace will be reassured.

In short, the Nkwanta community's stance recognizes that a healthy society requires interdependence between economic development and ecological sustainability. Their requests are born of pragmatism, not idealism. They seek a working balance between mining revenues and environmental protection - one that addresses valid concerns on both sides through prudent

regulations and a collaborative spirit. If the government takes its role as arbiter and mediator seriously, this is an achievable vision that serves all interests in the long run.

#### ***4.3.2 Improving Stakeholder Participation***

Another measure proposed by the respondents to improve mining operations in Nkwanta is the enhancement of participatory processes and stakeholder engagement in mining governance. As a community member explained:

*"The government needs to open more avenues for participation from regular citizens, not just industry and political elites. There should be more town halls, hearings, and opportunities to give input and feedback before permits are granted. Often it seems deals are made behind closed doors. There needs to be transparency."*

This aligns with observations by Standing and Hilson (2013) that Ghana's mining governance often suffers from a "participation deficit", especially amongst communities impacted by mining projects. They argue participatory processes promote good governance by bringing in diverse perspectives.

Some responses specifically emphasized engaging at the policy development stage:

*"Industry lobbyists seem to have the ear of government officials when it comes to drafting mining regulations. The policies tend to be really industry friendly as a result. There needs to be a seat at the table for environmental groups, community advocates, miners and others when laws are written so voices beyond just industry are heard."*

This aligns with arguments made by Andrews (2016) that mining reforms tend to be dominated by industry and government perspectives, marginalizing community and civic interests. Andrews advocates for participatory, inclusive policymaking processes.

Finally, some responses proposed structures for ongoing stakeholder engagement:

*"Once permits are issued, there needs to be community oversight bodies established that can monitor activities and lodge complaints or concerns. Things like citizen advisory councils with regular meetings involving the mining company, government, and community representatives. That way locals have a structured way to stay involved and raise issues."*

The survey results from Nkwanta underscore a growing demand worldwide for more inclusive and democratic processes within the mining industry. As those most directly affected by mining operations, local communities are asserting their right and duty to help shape the policies, assessments, and monitoring processes governing the industry. Their pleas underscore a growing recognition that sustainable and ethical mining requires inclusive decision-making that empowers communities and fosters mutual understanding between all stakeholders. At the heart of the community's demands is a call for democratization of mining governance through participatory processes that center local voices and knowledge. Top-down structures must open space for communities like Nkwanta to formally join multi-stakeholder planning dialogues, environmental assessment teams, compliance inspections, and policy consultations. Their intimate lived experience offers invaluable context about social, cultural, ecological impacts that outside technocrats may overlook or dismiss. Integrating community participation lends legitimacy and real-world wisdom to resulting policies and regulations.



Likewise, communities want guaranteed access to transparent information regarding all aspects of nearby mining operations - from business plans, environmental impact reports, and monitoring data to safety records and production volumes. Information is power, equipping communities to hold companies accountable. When details are opaque or withheld, mistrust flourishes. Radical openness must become the norm. Additionally, community participation in monitoring activities like sampling local water and soil allows independent verification of company self-monitoring claims. When communities are watching closely with the authority to levy penalties, compliance improves. Structures like local monitoring committees and citizen audits institutionalize this oversight. It must be stressed that fulfilling these calls for participatory governance requires sincere commitment from companies and governments to power sharing and transparency. Token gestures of listening will not suffice. Community members want tangible influence and enforcement capacity, not just a seat at the table. This means embracing diverse perspectives even when inconvenient. Yet done earnestly, integrating community insights strengthens social and environmental outcomes.

Therefore, to build mutual trust, investments must be made in communities' technical capabilities for participation and oversight. Local groups need training in areas like collecting environmental samples, monitoring equipment use, auditing documents, and evaluating impact assessments. Legal literacy regarding policies and company responsibilities is crucial. Capacity building removes imbalances and empowers communities to engage actively rather than reactively. It also strengthens local employment opportunities related to monitoring and oversight. Also, communities are not monolithic. Participation and consultation processes must be carefully designed to equitably include women, youth, elders, small farmers, landowners, and marginalized groups like indigenous peoples. Outreach through existing community networks helps ensure

broad-based representation. Varied formats like focus groups, field visits, and open forums allow participation of diverse voices. There will inevitably be tensions as companies accustomed to unilateral control must embrace power-sharing and communities learn to apply their new authority judiciously. Yet with patience and compromise, relationships characterized by animosity and distrust can gradually transform into partnerships.

Primarily, the future of sustainable and ethical mining lies in governance that entrenches local rights and capacities alongside industry needs. As the survey results from Nkwanta eloquently convey, we all share common purpose as temporary stewards of the lands that sustain us. For mining to responsibly co-exist within communities means empowering those communities to guide decisions affecting their shared home, just as we empower our own families regarding choices about our household. Their pleas for participation arise from pragmatism and conscience. For mining governance to serve all requires heeding these voices.

#### ***4.3.3 Investing in Small-Scale Miner Training and Formalization***

In addition, many responses focused on the need to invest more resources in training and formalizing small-scale and artisanal miners that currently operate informally in Nkwanta. As a respondent described:

*"Most small-scale miners like me have never received proper training on things like environmental management, safety standards, blasting techniques, etc. We use approaches passed down from our fathers that are outdated and dangerous. The government needs to create more programs to train us in modern, responsible mining so we can get the proper permits and transition to formality."*

This aligns with research by Aubynn (2009) who found capacity deficits amongst Ghana's artisanal and small-scale miners in areas like environmental practices, health and safety, mining techniques,

and financial management. The author argues targeted extension services and training can help formalize this sector.

In a similar vein, some respondents highlighted assistance with permitting:

*"The process for obtaining the proper permits and licenses for small-scale mining is incredibly complex and expensive for most of us without educational backgrounds. There need to be support programs through mining agencies that provide training on the permitting process and guide us through step-by-step. Access to geological surveys would also help identify viable deposits suitable for small operations."*

This aligns with observations by Dondeyne and Ndunguru (2014) that limited education, financing, and procedural knowledge are barriers to formalization for many artisanal miners in developing countries. They advocate measures to simplify bureaucratic requirements. Finally, some emphasized foundational mining education:

*"For those seeking to transition into responsible small-scale mining, the government should offer training courses that teach basic skills like mineral processing, drilling, mapping, mine planning, equipment uses, and accounting. These give miners the core competencies needed to succeed in the sector while also learning about environmental regulations."*

The calls from Nkwanta for greater investment in training and formalizing small-scale or artisanal miners represent a pivotal step towards building a more responsible, equitable, and sustainable mining sector. Artisanal mining operations, often operating outside legal frameworks, frequently perpetuate risks to miner safety, environmental degradation, and conflict. Transforming these informal activities into regulated micro-enterprises via strategic investments in education

and formalization processes offers a pathway to responsible growth. The targeted technical skills training helps miners operate more productively and safely. Courses in geology help identify deposits efficiently, while engineering and mineral processing skills optimize extraction and refinement with minimal waste. Business training equips miners to improve profitability via better equipment, cost control, and financial management. Safety education is crucial for using protective gear and hazardous material handling. Formal apprenticeship programs can expand knowledge transfer. Generally, capacity building enables artisanal miners to maximize output and revenue from their activities while greatly mitigating the hazards.

Transitioning artisanal miners into the legal formal economy extends multiple benefits. First, registration and permitting provides legal rights and protections for miners, ending harassment and exploitation. Secondly, it enables access to loans and insurance previously out of reach. Equally, being part of a regulated industry allows for better oversight of labor practices, environmental impacts, and safety standards through required compliance monitoring. Finally, tax contributions also increase, benefiting public budgets. For governments, integrating artisanal miners into the formal sector provides better visibility into the scale and impact of their activities. It facilitates the introduction of policies and incentive programs tailored to the realities these miners face, like subsidized safety gear and flexibly scaled licensing fees.

Furthermore, income growth and formalization can have significant positive spillover effects for mining communities. Higher household incomes raise living standards, funding access to education, healthcare, and adequate housing. The reduced environmental damage of formalized operations protects community health and preserves ecosystems crucial for sustaining agriculture and tourism. Legitimate micro-enterprises substitute dangerous makeshift mines, particularly

detering child labor. The integration and empowerment of artisanal miners means their concerns and insights directly inform policymaking.

Moreover, the formalization campaigns require well-designed implementation to succeed. Care must be taken to avoid top-down approaches lacking local context. As such, community needs assessments should inform program design, paired with extensive outreach and awareness-raising. Registration and permitting procedures must be streamlined and affordable. Multi-stakeholder initiatives can provide training resources by bringing together government, civil society, and industry. This should include proven incentives such as equipment financing programs and partnerships with mining cooperatives to ease market access. Progress may seem slow at first as miners would weigh the risks of emerging from the shadows. Thus, patience and trust-building are crucial. Government should engage miners as partners, not crack down punitively. Support and incentives must be sustained to solidify formalization and prevent reversion to illicit activities.

Artisanal mining, with appropriately enabling policies and resources, can be transformed from a danger into an engine of sustainable development. The artisanal and small-scale mining sector employs over 40 million people globally, disproportionately in rural areas of developing countries. Harnessing its potential responsibly presents an opportunity to drive economic growth and social progress. Workers' incomes rise, funding the education, health, and nutrition of mining families and injecting money into local economies through consumer purchases. Communities benefit through improved infrastructure, strengthened health systems, and reduced environmental impacts. Governments expand their tax base for investing in public services. The thoughtful formalization and capacity building enable artisanal mining to lift households out of poverty and provide livelihoods where few alternatives exist. Women miners, in particular, gain agency and opportunity in regions where gender inequality is entrenched.

The formalization process when successfully accomplished presents the opportunity to curtail the ‘resource curse’ where natural wealth fosters corruption and conflict. Instead, mining revenues become a tide that lifts all boats. However, it must be stressed that bringing artisanal mining into the formal economy is not a panacea. Risks of over-extraction and land degradation remain if checks are absent. As such, appropriate regulation, vigilant monitoring, and progressive taxation of volumes can prevent a race to the bottom. Formalization opens paths for introducing more sustainable practices as miners gain experience and means.

In short, investing in marginalized artisanal miners represents a reversal from neglect to empowerment of vulnerable populations. The residents of Nkwanta likely know many trapped in high-risk informal mining out of necessity. They see potential for a sustainable livelihood if proper support and training are provided. Their call reflects both pragmatism about harnessing artisanal mining’s benefits and compassion for improving miners’ welfare. Heeding this call means governments must commit dedicated resources and openness to integrating artisanal mining into policy frameworks. Industry leaders can share technical expertise and rethink supply chains to ethically source from micro-producers.

The Nkwanta community’s stance resonates with a growing global consensus on the pivotal importance of formalizing artisanal mining to achieve responsible outcomes. Their message articulates what marginalized mining communities worldwide have long advocated. Sustainable futures require empowering these communities with education, formal protections, and an equitable seat at policymaking tables. With inclusive support, artisanal mining can be transformed from an exploitative industry to one providing livelihoods and uplifting communities. The Nkwanta community understand firsthand the human dimensions of small-scale mining. Their call to action comes from both pragmatism and conscience. For mining to benefit all requires

heeding these voices calling for responsibility, equity, and stewardship of the land sustaining communities for generations to come.

#### ***4.3.4 Comprehensive Impact Planning***

Finally, the results indicate that respondents clamored for establishing robust requirements for impact assessments, reclamation plans, and closure plans as a means of improving mining operations in Nkwanta. As a respondent explained:

*"Far too often, new mines are approved without sufficient evaluation of environmental risks and liabilities. Rigorous environmental and social impact assessments should be mandated during the permit review stage. These will help identify potential problems upfront so preventative or mitigating measures can be incorporated into project design and operations."*

This aligns with analyses by Kumah (2006) and Akabzaa and Darimani (2001) advocating for strengthened Environmental Impact Assessment (EIA) requirements in Ghana's mining sector. They argue EIAs enhance project sustainability and give communities more participation. Some responses focused specifically on reclamation:

*"In addition to EIAs, mines should be required to develop and adhere to funded reclamation plans for rehabilitation of areas after mining ends. These plans need to be evaluated to ensure they are adequate and feasible. The government then needs to monitor actual reclamation activities during operations and especially at closure."*

This is supported by Cheng, L., & Skousen, J. G. (2017), who call for mandatory reclamation plans and financial bonds to fund remediation work.

Finally, some responses emphasized mine closure:

*"To prevent abandonment issues, mine permits should stipulate mandatory closure plans that designate how a site will be decommissioned, cleaned up, and made safe at end-of-life. The plans can then guide reclamation. The government needs to ensure companies follow through on closure plans and not just leave contaminated sites behind."*

The residents of Nkwanta's resounding support for mandated comprehensive impact evaluations and mitigation strategies throughout the entire lifespan of mining projects signals a pivotal shift in public expectations. It reflects a society increasingly concerned about the broad consequences of mining and committed to protections for communities and ecosystems. This stance demands rigorous precautions be integral to mining, not optional add-ons. Most crucially, the public wants robust pre-approval assessments of projected impacts across social, environmental, cultural, health, and economic dimensions. The assessments should use inclusive processes that engage potentially affected communities through public hearings, focus groups, and participatory impact mapping. Local knowledge must inform evaluations to fully understand place-based dynamics like seasonal water flows or the cultural significance of a landscape.

Thorough pre-operational impact assessments establish baselines for later monitoring. They also allow for proactive mitigation planning to minimize harm, unlike reactive approaches that address harm after it occurs. The public expects assessments to seriously consider if some locations are fundamentally incompatible with mining due to irreversible risks. The emphasis is on foresight, precaution, and avoidance of harm. Likewise, continuous monitoring throughout operations enables rapid response to evolving unforeseen issues before they intensify. The public wants regular inspection of practices, effluent levels, soil and water quality, and emerging community concerns. Monitoring should be transparent, with results accessible to the public in



real-time. Companies must be compelled to adjust practices based on monitoring data indicating risks.

At end-of-life, comprehensive rehabilitation plans for the land and affected communities are demanded. Mines cannot be abandoned, leaving permanent scars. Reclamation must restore ecosystems, habitats, biodiversity, water sources, and productive soils to sustain communities after mining ceases. If full restoration is impossible, ongoing remediation and support for communities are obligated. Across all phases, the public expects companies to maintain contingency funds and insurance policies that fully cover potential close-down procedures, environmental damages, and community support needs in a worst-case scenario. No costs of irresponsible mining should ever be offloaded onto the public. This comprehensive approach reflects growing intolerance of mining practices that exploit nature and people for profit, abandoning them after. It conveys an expectation that avoiding long-term harm is a non-negotiable prerequisite for mining approval, not an optional extra. Protections must be woven into the entire process, start to finish.

In addition, the stance taken by Nkwanta residents and echoed by many globally stems from past betrayals of trust and foregone opportunities for responsible development. It says “no longer.” As the children's futures now take priority over quick profits. To achieve this vision requires governments willing to enact and enforce stringent regulations that entrench enduring environmental protections and community livelihoods. It means companies embracing sustainability as central to operations, not just public relations. Responsible mining must be the standard, not the exception. This entails overcoming inertia and perceived risks of change. Governments may hesitate to impose burdensome requirements against industry resistance. Companies may complain it stifles profitability. However, smart firms will recognize reputational

and legal advantages in responsible practices, whereas laggards will face public hostility and divestment. Governments that stand up for communities and sustainability will earn public trust.

In short, the stance emerging from Nkwanta and beyond portends a society increasingly intolerant of reckless mining practices that sacrifice communities, cultural heritage, and ecosystems for corporate gain. It opens possibilities for mining where appropriate, but only if bounded by stringent precautions and reparations. This growing public resolve stems from a recognition of our interdependence with the living world. It reflects a wise society that learns from past mistakes to demand better futures. With determination and cooperation, a new paradigm is attainable where mining, communities, and ecology coexist. Some deposits may prove incompatible and be spared. Elsewhere, mines will arise as models of social responsibility and environmental care, guided by scientific monitoring and inclusive decision-making. Gradually, the most objectionable enclaves will evolve or close as expectations rise. Though the path forward has challenges, its destination promises just and sustainable co-existence between mines and communities bound together on the land that sustains them.

## CHAPTER 5

### CONCLUSION AND RECOMMENDATION

#### 5.0 Introduction

This section details the summary of the findings centered on the three objectives of the study. It details the summary of the findings of the perception of gold mining in the Nkwanta community; the demographic characteristics informing the support or opposition of mining operations as well as the suggested measures to improve mining operations in the community. It also includes recommendations for policy and potential future research.

#### 5.1 Conclusion

This study employed a quantitative research approach to investigate the perception of gold mining in the Nkwanta community. This study specifically employed the cross-sectional approach. The study relied on primary data collected from a sample of 352 respondents. A semi-structured questionnaire was developed to serve as the primary data collection instrument for this study. The analysis of data for the first two research questions: relative importance index and logistic regression were conducted in R programming software. The open-ended questions were analyzed thematically. The results were presented in tables and quotes.

The results provided vital insights into how the Nkwanta community perceives and prioritizes the impacts of gold mining. The finding that public health consequences are viewed as the most severe speaks to lived realities. The Community members appeared to directly link mining activities like excavation, drilling, heavy machinery usage, and environmental contamination to perceived proliferation of diseases and health problems locally. This grounded connection reflects public health research in Ghanaian mining communities documenting higher prevalence of malaria due to ecological changes favoring mosquitos breeding, as well as

respiratory illnesses and skin conditions linked to pollution exposure. The immediacy and visibility of health impacts likely renders them more salient than broader environmental damage. The study also established that economic benefits of mining like employment and infrastructure development are recognized by the community. However, the score being lower than health consequences implies economic gains are considered secondary to social and ecological costs rather than the priority. This reveals nuanced perspectives that resist simplistic narratives of mining being unanimously welcomed or rejected. Also, the study revealed that environmental concerns such as deforestation, soil erosion, and water pollution are not perceived as acutely in day-to-day lives as visible health disruptions that directly threaten wellbeing. The Impacts on forests or farmlands may register as gradual and diffuse compared to illness.

In terms of demographics associated with supporting or opposing mining, the logistic regression analysis reveals intriguing patterns. Those with only primary or tertiary education are more likely to resist mining compared to the uneducated. This implies both the least and highly educated object more strongly than those with secondary education. For the least educated, this sentiment likely stems from reliance on traditional livelihoods like subsistence farming that are disrupted by concessions. Limited alternative opportunities exacerbate dependence on threatened land and resources. However, for the highly educated, resistance may stem from post-materialist values prioritizing aesthetics, ecology, and quality of life over economic considerations. Higher education enables awareness of long-term, non-visible mining consequences that the medium educated may overlook when weighing benefits. Additionally, the finding that higher annual income increases odds of opposing mining which suggests an influence of financial security in shaping attitudes. Wealthier segments of the community may feel economically established enough to focus more on protecting environmental amenities and avoiding disruption rather than

needing income and infrastructure from mining. In contrast, the unemployed and lower income groups could be more willing to bear costs based on basic livelihood necessities.

With regards to the proposed measures, from open-ended responses point to four priority areas for improving the sector. Firstly, strengthening regulations and enforcement through increased audits, higher fines for violations, and mandated rehabilitation is seen as key to ensuring responsible practices. Secondly, enhancing participatory processes in decision-making, monitoring, and oversight is viewed as vital to represent community interests often sidelined currently. Thirdly, supporting formalization and training programs for small-scale miners is endorsed to build capacity and improve sustainability. Finally, requiring comprehensive impact planning through EIAs, reclamation plans, and closure plans aims to mitigate risks proactively. Overall, priorities center on health, environment, democratic governance, and social wellbeing - beyond limited economic measures.

In summary, while opportunities provided by mining are valued, priorities like public health, social well-being, environmental protection, and democratic governance stand out as paramount to foster broader acceptance and sustainability. Trade-offs exist between economic gains and wider costs spanning health, cultural continuity, and ecological integrity. Thus, leveraging mining for community development requires centered policies and initiatives that align operations with local values and needs. The study reveals multifaceted community perspectives that resist narrow framing into pro- or anti-mining camps. This highlights nuances sourced from lived experiences, socioeconomic differences, and values influencing cost/benefit calculations.

## **5.2 Recommendations**

Based on the insights gained through this study of community perspectives on gold mining in Nkwanta, several recommendations can be made to key stakeholders:

1. For policymakers, the findings highlight the need to strengthen mining regulations and enforcement capacities to ensure compliance. This includes conducting frequent audits and inspections of mine sites, establishing stringent penalties for violations that act as real deterrents, and mandating and overseeing rehabilitation plans. Policies should also be developed through participatory processes that engage all stakeholders, not just industry representatives. Thus, ongoing citizen advisory boards could facilitate continued community participation and oversight after permits are granted.
2. For mining companies, practices must be oriented to mitigate public health risks and ecological damage in order to earn community trust and maintain license to operate. Robust impact assessments should inform preventative measures, while firms must follow through on rehabilitation commitments during operations and at closure. This involves collaborating with health providers to expand services and working to avoid disruptions to traditional livelihoods like smallholder farming can address key concerns.
3. For government, agencies responsible for mining need strengthening to properly oversee the mining industry, orient policies towards national priorities beyond economic gains, and balance diverse interests. Royalties and taxes should be invested towards enhancing enforcement, as well as supporting health infrastructure, farmer assistance programs, and environmental monitoring in mining regions. Decentralizing oversight responsibilities to local authorities could aid monitoring and accountability.
4. For NGOs/civil society, advocacy is needed to give voice to community concerns and provide legal/technical support. This includes monitoring operations, documenting impacts, and assisting with complaints and compensation processes. NGOs can also

facilitate awareness-raising regarding mining and environmental education in communities, help organize resident associations, and pressure firms and government for more responsible practices.

5. For communities, platforms should be strengthened that enable impacted groups to participate in decisions affecting their well-being. This can encompass demanding seats at the table for policy formation, insisting on community approval processes for new projects, forming resident monitoring bodies, articulating priorities and concerns to companies, and electing local leaders who will represent village interests.
6. For academia, further research is needed to support reforms. Comparative studies could illuminate community differences in impacts and perceptions. Research could unpack complex dynamics influencing attitudes. This involves assessments of health status, pollution levels, and socioeconomic indicators related to mining are lacking. Long-term monitoring is needed to track evolving sentiments.

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## APPENDIX A

### Questionnaire

#### Demographic Characteristics

1. Age .....
2. Gender:  
Male  
Female
3. What is the highest level of education you have completed?  
No formal education  
Primary education  
Senior High School  
Bachelor's degree  
Graduate degree
4. What is your current occupation?  
Employed  
Student  
Retired  
Unemployed
5. What is your monthly household income?  
Less than 1500 cedis  
1,500 – 2,999 cedis  
2,000 – 2,499  
2,500 - 3,999  
4000 or more
6. Have you ever worked in a mining-related job in the community?  
Yes  
No
7. What type of job was it .....
8. How long did you work in that job .....

9. Has anyone in your household ever worked in a mining-related job in the community?

Yes

No

10. What type of job was it .....

11. How long did the household member work in that job .....

**Perception of gold mining activities**

These questions seek to understand how you perceive the gold mining activities in your community. Using a scale of 1 is strongly disagree (SD), 2 is disagree (D), 3 is agree and 4 is strongly agree, please indicate your position on the following statements on the impacts of gold mining activities in the Nkwanta community.

Statement: Gold mining activities in Nkwanta have	SD	D	A	SA
contributed to deforestation				
contributed to soil degradation				
contributed to water pollution				
contributed to air pollution				
contributed to noise pollution				
negatively affected the wildlife				
contributed to health problems				
contributed to the spread of diseases				
contributed to the local economy				
created job opportunities for people				
contributed to the infrastructure development				
destroyed livelihoods (especially for farmers)				
contributed to the development of the community				
brought about social unrest				

**Attitudes towards gold mining activities**

This section seeks to assess the attitudes of people towards gold mining activities in the Nkwanta community.

1. Environmental Impact

- On a scale of 1-4, do you believe that gold mining has a positive or negative impact on the environment? (1 being very negative impact, 4 being very positive impact)

- On a scale of 1-4, how important is it to you that gold mining companies engage in environmentally sustainable practices? (1 being not at all important, 4 being extremely important)
2. Economic Impact
- On a scale of 1-4, how important do you think gold mining is as an economic activity in your community/country? (1 being not at all important, 4 being very important)
  - On a scale of 1-4, would you support the development of new gold mines in your area? (1 being strongly oppose, 4 being strongly support)
  - On a scale of 1-4, would you be willing to pay more for gold products that are certified as being ethically sourced and environmentally sustainable? (1 being strongly oppose, 4 being strongly support)
3. Health and Safety
- On a scale of 1-4, how concerned are you about the potential health and safety risks associated with gold mining? (1 being not at all concerned, 4 being extremely concerned)
4. Community Involvement
- On a scale of 1-4, do you believe that indigenous peoples and local communities should have a say in decisions related to gold mining in their territories? (1 being strongly oppose, 4 being strongly support)
  - On a scale of 1-4, how aware are you of any regulatory measures in place to govern gold mining in your community? (1 being not at all aware, 4 being very aware)
  - On a scale of 1-4, do you think that gold mining should be subject to stricter regulations? (1 being strongly oppose, 4 being strongly support)

**Measures to improve the mining sector in Nkwanta.**

1. On a scale of 1-4, how effective are the current measures in regulating mining activities in Nkwanta? (1 being effective, 4 being not very effective)
2. In your opinion, what measures should the government play in improving the mining sector in Nkwanta?  
.....  
.....  
.....
3. What measures do you think could be implemented to improve the mining sector in Nkwanta?  
.....  
.....  
.....

**Thank you for completing the questionnaire!**