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The role of Collaboration in dealing with Ankobra River Pollution

Investigating the power structures responsible for the pollution in Adelekezo and Eziome, Western Region of Ghana

Master's thesis in Natural Resource Management

Supervisor: Dr. Elizabeth Barron

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ABSTRACT

Artisanal small-scale mining operations in Ghana have increased over the years, and this can be attributed to factors such as the introduction of new technology and licensing irregularities, which have negatively impacted the environment and rural communities. The Ankobra basin is a valuable resource for a large population in southwestern Ghana but is significantly polluted by illegal alluvial gold mining. To eradicate overexploitation of the basin, the government has employed various strategies, including repression, formalization, and collaborative approaches, but these have failed due to power dynamics among stakeholder groups, informalities in social structures, and institutional failure. This study used a post-structural power theory to analyze the power capacities of key actors, institutions involved, and informalities influencing decision-making in illegal mining practices and their impact on the environment and rural livelihoods in Adelekezo and Eziome (two estuarine communities along the Ankobra basin). A total of 16 interviews and 3 focus group discussions were conducted to collect data from a variety of actors, including representatives of government institutions, traditional leaders, fishermen, and local residents. Participant observation was also conducted to get a real-life experience of pollution's impact on these local communities' livelihoods. The study findings indicate that pollution has had a significant impact on the community's access to drinking water, economic activities like fishing and fish trading, food, and agriculture. Collaborative strategies, such as the Community Mining Scheme, were found to be constrained by power dynamics within the bureaucratic governance system, which perpetuated informalities and power structures contributing to illegal mining and pollution. These challenges included a lack of coordination among governing institutions, the marginalization of district assembly representatives, and distrust among local residents towards traditional authorities due to allegations of corruption. The study recommends establishing an inclusive community mining oversight committee with strong local representation and implementing a transparent strategy that considers participants' interests, provides incentives for positive behavior, and imposes penalties for actions against the common good.

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List of Abbreviations

ASM	Artisanal Small-Scale Mining
BC5	Building Capacity to Crosslink Climate Change and Coastal Pollution
CBM	Community-Based Management
CMS	Community Mining Scheme
DCE	District Chief Executive
EPA	Environmental Protection Agency
FDG	Focus Group Discussion
ISO	International Organization for Standardization
IWRMP	Integrated Water Resource Management Plan
MINCOM	Minerals Commission
MMDA	Metropolitan, Municipal and District Assembly
MTTU	Motor Transport and Traffic Unit
NGO	Non-Governmental Organization
NSD	Norwegian Centre for Research Data
SDG	Sustainable Development Goals
SFP	Sustainable Fisheries Project
SWOT	Strengths, Weaknesses, Opportunities, and Threats
UN	United Nations
UNEP	United Nations Environmental Programme
WRC	Water Resource Commission

CHAPTER ONE

1. Introduction and Background

The combined impacts of climate change and coastal pollution pose a threat to global coastal resources, prompting urgent measures and initiatives to conserve coastal ecosystems. Sufficient data on the global scale has revealed the adverse impacts of climate change, especially on coastal areas. Sea level rise, flooding, global warming, and loss of habitat are among the prevailing impact of climate change on coastal resources (Ayers & Forsyth, 2009). International and regional advocacy on the need for regulations on the sustainable use of coastal marine resources, including reduction in carbon dioxide and other greenhouse gases, has yielded promising results, but studies suggest there is still much to be done (Ayers & Forsyth, 2009; Kapuka, Hlásny, & Helmschrot, 2022; Singha, 2018).

Regions that significantly depend on climate-sensitive sectors such as agriculture, water resources, and forestry are much more vulnerable to impacts of climate change (Singha, 2018). Most of these regions are characterized by rural populations and low-income economies and face significant challenges in coping with the current dangers of climate change. In Sub-Saharan Africa, flooding, for example, is a recurring natural disaster with significant damage caused every year. One of the factors contributing to this problem is the poor infrastructure that supports the movement of sewage. Coastal pollution and climate change vulnerability are on the rise in Ghana, according to reports. Eighty landing sites and beaches in the western area used to discharge and process catch, moor, or beach boats, are in danger of coastal erosion and flooding (Mensah, Amoako, & Kankam, 2015). Climate studies have indicated an estimated sea-level rise of 16.5cm by 2050 in the area (MESTI, 2013).

According to Osman, Nyarko, and Mariwah (2016), high vulnerability and risk levels exist at the Ankobra estuary in the western region of Ghana. About 45% of the population and 29% of buildings within the Ankobra Estuary are situated in the flood zone. This poses a worrying picture for the residents who depend on coastal marine resources for their livelihoods. In combination with the overwhelming vulnerability of the residents along the coastal regions to flooding, pollution from human activities, particularly from informal artisan mining or galamsey (see figure 1), is causing nationwide problems such as destruction of forest lands, pollution of water bodies and

health and sociocultural issues to workers and surrounding communities (Attiogbe & Nkansah, 2017).

Galamsey in water bodies poses a severe danger to coastal ecosystems. This activity results in the loss of agricultural lands and modification of landscape, as well as has an impact on water quality due to high concentrations of chemicals, metals, and other dangerous compounds in the processing of ore (Attiogbe & Nkansah, 2017; Emmanuel, Jerry, & Dzigbodi, 2018). Increased levels of turbidity of water due to washing of ore affect living organisms in the rivers and increase the cost of water treatment in affected areas (Emmanuel et al., 2018; Mensah et al., 2015). In some areas in Ghana like Obuasi Municipality, pollution of the rivers such as Kwabrafo, Pompo, Kunka, and Nyam due to illegal mining has caused a significant reduction in fish stock and extinction of some species (Emmanuel et al., 2018).

The government of Ghana has implemented various methods to manage resources at both international and local levels. These efforts include the adoption of the United Nations' agreement on sustainable resource management as a crucial aspect of planning and legislation. The UN Sustainable Development Goals (SDGs) provide a foundation for how to achieve the targeted biodiversity conservation and management goals needed to protect and improve coastal ecosystems in Ghana. Nationally, attempts to manage polluted water resources have taken a top-down approach, which has not been well-received by the local communities (Babut et al., 2003). Recent clashes between government officials and the local people call for collaborative management of mining activities in the Ankobra estuary. A bottom-up approach based on science and participatory processes involving the local stakeholders may help build resilience on the impacts of climate change and the need to protect water resources from pollution because it builds on existing cultural norms and addresses local development concerns.

Reports by the United Nations (UN) have signaled the need to improve on sustainable management of water resources (SDG 6), both as related to clean drinking water and environmental conditions. In the Sub-Saharan regions, about 387 million people are reported to lack access to basic drinking water services, and a global decline in coastal mangrove areas and high turbidity of lakes is causing damage to biodiversity and livelihoods. Even though the average implementation rate for the integrated management of water resources globally increased by 5% between 2017 and 2020, the UN suggests that a more productive and progressive approach locally should be adopted to accelerate efforts to meet SDG 6 by 2030. They advise that countries build

on their multi-stakeholder monitoring processes to understand major barriers and identify priority actions (UN, 2021).

The 2030 Agenda for Sustainable Development relies on stakeholder engagement and partnerships to implement the SDGs. This project then seeks to offer a multi-stakeholder perspective that will build on community collaboration to reduce pollution and ensure sustainable management of the estuary. An effective stakeholder engagement that is collaborative and inclusive can improve the likelihood of equity in decision-making, provide solutions for conflict situations, and allow ideas to be tried, tested, and refined before adoption (Leal Filho & Brandli, 2016). This thesis is part of a larger project - Building Capacity to Crosslink Coastal Pollution with Climate Change (BC5) in the Norhed II program funded by Norad under “Climate Change and Natural Resources” (Grant Number: 71762). It aims to enhance knowledge and capacity for managing marine coastal ecosystems and resources sustainably in Ghana and Tanzania. The project aligns with the SDGs and focuses on the impact of coastal pollution and climate change on these ecosystems. It is concerned with life below water (SDG 14) and other cross-cutting relevant goals. The project is a strategic north-south-south collaboration between the Norwegian University of Science and Technology (NTNU), University of Ghana (UG), and affiliated collaboration by the University of Dar Es Salaam, Tanzania. BC5 focuses on the combined impact of coastal contamination and climate change on coastal ecosystems in Ghana and Tanzania, addressing the gap between research needs and practice, education, and the management of coastal resources. Particularly, the project seeks to increase the capacity of higher education and build bridges between researchers, decision-makers, and local communities¹. It is on this premise that the case study of the Ankobra river pollution due to illegal mining is drawn.

1.1 Problem Statement

The past years have seen an uproar of the impact of overexploitation of natural resources, specifically the water resources in Ghana, which can be traced to the surge in informal, illegal mining (galamsey). Notably, the Ankobra river is amongst the most impacted by overexploitation. The water resource has been heavily polluted by waste products of alluvial mining, which has

¹ Additional information on BC5 can be found on <https://www.ntnu.edu/web/norhed2/bc5>

caused environmental problems in all other sectors of the society (Attiogbe & Nkansah, 2017; K. J. Bansah, Dumakor-Dupey, Kansake, Assan, & Bekui, 2018).

In 2017, the government pronounced a ban on small-scale mining operations (both licensed and unlicensed), and used the military to enforce the bans. This resulted in clashes between workers, local people, military, and other involved stakeholders. A study by Mensah et al., (2015) on Ezioime township's adaptation to the government's interventions revealed that there were some tensions among the stakeholders involved in the management of the river as one informant shared that the local people were powerless in the face of the political and market forces driving degradation of the Ankobra resources, such as illegal mining and dumping of tailings from Adamus resources operations. Statements like these hint at a level of power in the management of natural resources. The locals are interested in conserving the natural resource because it forms part of their lives, but due to the political influences, they feel ignored in decision-making. This situation may have influenced the reaction of the youth and galamsey workers to the interventions implemented by the government in 2017. Other studies have also pointed to a lack of coordination, incomprehensive collaboration, and consultation among stakeholders by decision-makers as reasons for the resurgence in illegal mining in the Ankobra basin (Banchirigah, 2008; K. J. Bansah et al., 2018). The existence of the integrated water management policy which should include the voices of all stakeholders has not functioned well leading to these repressive and legislative approaches utilized by the government over the years. In terms of fishery management, a successful community-based policy and approach has existed since the 1990s but little effort has been taken to tackle illegal mining and its impact on fisheries and livelihoods in the same collaborative manner. A significant contribution to fighting environmental degradation from illegal mining has been the community mining scheme (CMS) which was recently introduced by the Ministry of Lands and Commission. Nevertheless, the effectiveness of the scheme in ensuring local participation and inclusiveness in decision-making, and dealing with the sociopolitical complexities on the practice of illegal mining activities and its pollution is yet to be examined.

This research therefore investigates the power dynamics among the local people, government institutions, traditional authorities, and the social structures responsible for the pollution of Ankobra river in Ezioime and Adelekezo communities. It further examines the current collaborative management policy in dealing with the pollution of the Ankobra Estuary.

Specifically, it assesses the role of the community mining scheme in regulating the activities of artisanal mining in these areas.

1.2 Research Questions and Objectives

The existing academic literature and public discourse hint at significant power imbalances among actors in the mining sector in Ghana. Key actors include various sectors of the Ghanaian government, international mining companies, mining migrant laborers, village chiefs and elders, village residents, and specifically residents working in the mining sector. These power imbalances are reflected in how decisions are made and in how laws are enforced. Despite strong rhetoric around the idea of collaborative management for more effective management of natural resources, observed practices suggest local community actors are further degrading the environment and themselves being exploited by more powerful actors. What factors are resulting in the ongoing degradation of the environment? This study examines the power relations among these key stakeholder groups in the Eziome and Adelekezo communities regarding decision-making on the Ankobra Estuary. This focus was based on the idea that further elucidation of power dynamics is necessary to address the causes of environmental degradation due to galamsey.

Further objectives are:

1. To examine the impact of mining pollution on local livelihoods in the study areas.
2. To assess the social systems responsible for the production and reproduction of power dynamics in Eziome and Adelekezo
3. To assess what changes in legal execution and practice would be necessary for an effective collaborative management strategy in the Ankobra Estuary.

4.6.7 Significance of Study

The government of Ghana has adopted several initiatives to tackle water pollution. Still, these have not yielded the intended purpose as illegal alluvial mining operations keep increasing, further damaging the water resources. This suggests that the acceptance and legitimization of government initiatives on the sustainable use of the estuary's resources may depend on variables

such as grassroots perspectives, institutional functioning, and social structures that shape behavior, which the government has not considered, and are the subject of this research project. As a contribution to the public discourse on iASM and its effect on local livelihoods, this study helps to explore the power relations that hinder the effective management of the resource and bring an understanding to perspectives of various stakeholder groups, most importantly that of local residents who are affected by the pollution. Soliciting local perspectives is crucial to understanding the gravity of damage the pollution is causing to livelihoods and development. This document also contributes to interdisciplinary research on coastal management in Africa, which is the main objective of BC5.

1.3 Definition of Key Concepts

Artisanal small-scale mining (ASM): This refers to gold mining practices that are carried out by small groups of individuals or cooperatives with limited capital investment and using simple tools. This type of mining typically operates on a small scale and has limited production. There are two types of ASM, informal and formal.

Formal, legal (fASM): This refers to small-scale mining operations that have been legally authorized through the process set by the minerals commission. These operations have obtained permits to operate and are compliant with regulations.

Informal, illegal (iASM): This refers to mining activities that are deemed illegal by the Minerals Commission or are carried out with permits that do not conform to the regulatory standards set by the Commission. Such mining practices are commonly referred to as “Galamsey” and are predominantly conducted in rural regions.

Stool lands: In Ghana, the term “stool” or “skin” lands is commonly used to describe this type of land, which is controlled by traditional leaders for the benefit of their subjects, community members, or company members. It covers any land or property rights held by the head of a particular community or the captain of a company.

CHAPTER TWO

2. Literature review

Introduction

This chapter provides an outlook of the existing literature on mining in Ghana as it compares to other regions, small-scale mining operations, and the various discourses surrounding small-scale illegal mining in Ghana. The chapter also includes literature on local-based livelihood and the impacts of illegal mining operations.

2.1 Brief History of the mining industry in Ghana

This section aims to provide a historical context for the current management approach to mining and natural resources, including the discourses surrounding it. Understanding the power dynamics and conflicts between traditional authorities, local communities, and government institutions requires knowledge of the historical trends that have shaped the industry. Therefore, this section briefly outlines the mining practices before the 15th century, the colonial era from the 1470s to the 1950s, and the current management practices. Gold mining has played a significant role in the development of Ghana, dating back to pre-colonial times. Prior to the arrival of the Europeans in 1471 and the subsequent colonization of Ghana, small-scale mining of gold and diamonds was commonplace. Mining was carried out by individuals or groups within their own lineage or stool lands, which were lands owned collectively and overseen by a central authority, usually a chief (Abdulai, 2017; Dumett, 1999). The Chiefs played a crucial role in the control and management of resources and were responsible for preserving the land for the entire community. The chieftaincy institution utilized gold and other minerals for traditional cultural practices and exchanged them along trans-Saharan trade routes with the Moors and Phoenicians (Aryee, Ntibery, & Atorkui, 2003).

The colonial era (1470s – 1950s) era however marked a new period in the gold mining industry in Ghana, characterized by expatriate-led capitalism, commercialization of stool lands which contributed to the erosion of traditional authority structures (Abdulai, 2017). According to Tsikata (1997), British mining companies played a crucial role in shaping the mineral policy in colonial Ghana. For instance, the first official European gold mining company established in the Gold Coast Colony was the African Gold Coast Company in 1878. Tsikata (1997) points out that

colonial mineral policy, which included setting up a legal and administrative framework for mining operations, ensured secure ownership for those granted mineral rights, resolved conflicts between mining companies and local communities, and generated government revenue through taxes and duties, and promoting self-sufficiency within the British Empire (Hilson, 2002; Tsikata, 1997, p. 9). Much of this was at the expense of traditional mining activities. For example, the Mercury Ordinance Law of 1933, which prohibited the use of mercury in mining, was pushed by British mining companies, who applied pressure on both the colonial office in London and the governor of the Gold Coast to create opportunities for their entry into the colony. Local, small-scale miners often used mercury in their mining practices. This law was in effect an attempt to criminalize small-scale mining to exclude rural people from the activity and redistribute mineral wealth in favor of British mining companies.

After Ghana's independence in 1957, the value of gold output decreased, and many struggling companies had to either reduce operations or resort to reclamation mining. The government eventually bought equity shares in the mines, and by 1961 all properties except for Obuasi and Konongo were nationalized. The government of Ghana established the State Gold Mining Corporation (SGMC) in 1961 (Tsikata, 1997). Laws were passed giving the government control over mineral-rich lands, with mineral rights vested in the President on behalf of the Republic. This era of state-owned mining led to a significant decline in the country's economic situation. In contrast, by the early 1960s, South Africa was fully developed and attracted significant foreign interest, while the other important mining regions in Ghana remained underdeveloped (Akabzaa & Darimani, 2001; Hilson, 2002). By 1986, the country had shifted to a neoliberal agenda and adopted a structural adjustment program, which included the privatization of the extractive industry. The Minerals and Mining Law of 1986 established a Minerals Commission and provided extensive tax incentives to foreign mining investors, resulting in a significant increase in mineral output and a resurgence of the mining sector (Abdulai, 2017; Tsikata, 1997). However, this period did not result in greater inclusiveness in society or a significant impact on poverty reduction in mining-affected communities. A shift from underground mining to surface mining after the surge in multinational investments resulted in the loss of agricultural lands to large-scale companies which increased conflicts and agitations between the local people and the companies.

2.2 Structure of Gold Mining in Ghana

Ghana has the potential to produce various minerals, including gold, diamond, bauxite, manganese, limestone, silica sand, kaolin, and salt. Foreigners are the main owners of large mining companies, while small-scale mining is restricted to Ghanaians. Gold is the most valuable mineral, accounting for over 90% of total mineral value and attracting the most attention from both large and small-scale operators. Both foreign and local companies are involved in mineral exploration, with over 250 companies holding mineral rights for gold exploration and over 3000 registered small-scale miners (Akabzaa & Darimani, 2001; MINCOM, 2019). Ghana's gold mining activities under the Mineral Commission are divided into two main operations; Large Scale and Small-Scale (ASM) mining. These operations have significantly contributed to the overall GDP of the Ghanaian economy.

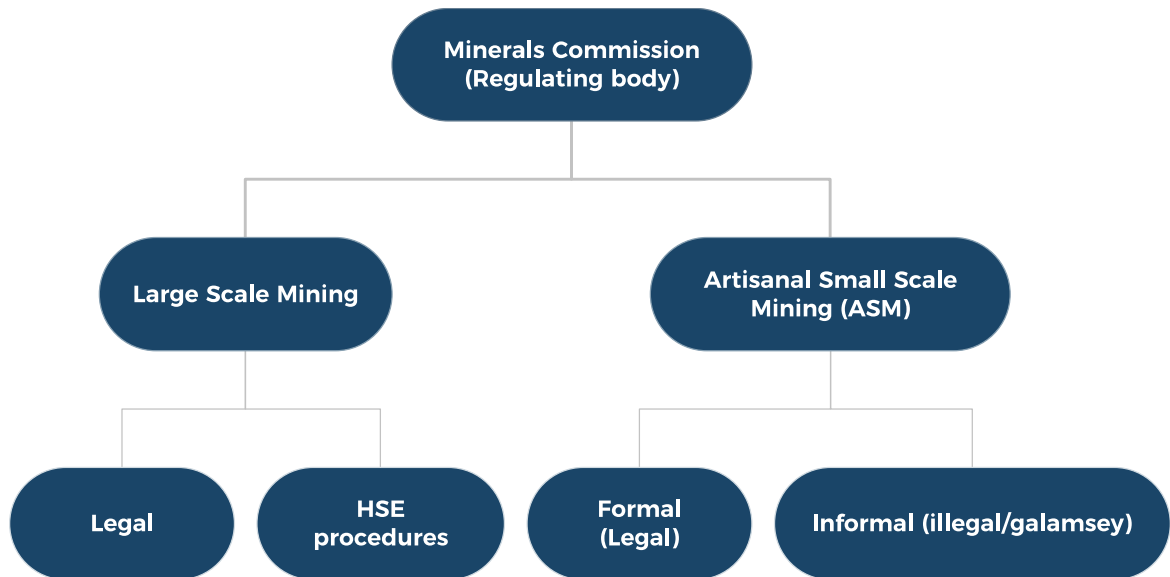


Figure 1. Structure of Gold mining in Ghana

Before the era of structural adjustment, the government of Ghana had a minimum of 55% ownership in all major mining operations. However, the ownership landscape has shifted dramatically with private investors now playing a major role, and foreign companies controlling an average of 70% of shares in these mines. The government holds 10% free shares in each mine, with the option to purchase an additional 20% at market price. The main players in large-scale mining exploration are primarily junior companies from Canada, Australia, and South Africa, with smaller investors from countries such as the United States, and China (the recent takeover of

Golden Star, Wassa Mine) (Akabzaa & Darimani, 2001). Currently, there are 16 large-scale companies producing minerals of which 14 are gold mines, one each bauxite and manganese mines respectively (MINCOM, 2020). From 2018 to 2020, large-scale gold mining operations produced a total of 8,632,418 ounces of gold which accounted for 63.19% of gold production.

Despite the persistent concerns surrounding environmental degradation and occupational hazards in large-scale mining operations, the industry has been able to maintain a certain level of operational stability through the implementation of various regulations and initiatives aimed at promoting corporate social responsibility, sustainability, and attracting foreign investment. Many lending agencies that finance large-scale mining activities require the mining companies to comply with environmental standards. Multinational gold mining corporations commonly follow the International Cyanide Management Code (ICMC), ISO 1900, 14000, and other environmental management standards through MNC-led supply chains. These guidelines are crucial for companies to maintain their investments and trade as required by organizations such as New York Stock Exchange (NYSE), United Nations Guiding Principles on Business and Human Rights, and the International Council on Mining and Metals and Global Compact (Matten & Moon, 2008).

ASM on the other hand is an important sector in the country's mining industry, as Africa's leading gold producer and sixth in the world. The sector employs over a million workers and can bring in substantial revenue for the government if it is properly administered. Having gone through several regimes of management, it is currently formalized and incorporated into the updated Minerals and Mining Act (703, 2006) in sections 81-99 by the Minerals Commission (MINCOM, 2021). Despite its legalization, some small-scale miners still operate illegally due to difficulties in the registration process (Aubynn, 2009a). This has led to two groups: those that are registered and licensed, and those that operate illegally without license (Akabzaa & Darimani, 2001, p. 26). Since this form of mining largely involve simple tools in exploration and processing, it does not produce as much as the large-scale mining though there are more ASM operations. The sector has recently become more industrialized, with increased use of machinery, which is imported, leading to increased environmental, safety, security, and health issues. Several discourses surround the operationalization of ASM in Ghana which is elaborated in following chapters.

2.3 Legal Framework for Mining Sector in Ghana

To comprehend the management system of water resources and minerals, as well as the responsible institutions and actors, it is important to establish a contextual background of the law. This will aid in understanding the institutional power dynamics associated with its management. Mining in Ghana is regulated by four principal Acts namely; The Minerals Commission Act (Act 450 of 1993), Minerals and Mining Act, (Act 703 of 2006), Minerals Mining Amendment Act (Act 900 of 2015), and Minerals and Mining Amendment Act (Act 995 of 2019). These laws, together with several regulations permit the operations of mining in Ghana and gives authority to several regulatory bodies to supervise the activities of mining. Some of the relevant institutions tasked with monitoring and ensuring compliance include:

- The Ministry of Lands and Natural Resources: The Ministry of Lands and Natural Resources (MLNR) was established in accordance with Section 11 of the Civil Service Law 1993 (PNDCCL 327), and it has the responsibility to ensure the effective management of the nation's mineral resources for socioeconomic development and growth, as well as the sustainable management and exploitation of the country's lands, forests, and wildlife resources (Eshun & Okyere, 2017).
- The Minerals Commission: According to Article 269 of the Constitution of 1992 and the Minerals Commission Act of 1993, the Minerals Commission (MINCOM) was created (Act 450). The Minerals Commission oversees regulating and managing the use of Ghana's mineral resources, as well as coordinating and carrying out policies related to mining, as the country's primary promotional and regulatory authority for the minerals sector. Through efficient monitoring, it also guarantees adherence to Ghana's mining and mineral laws and regulations (Eshun & Okyere, 2017).
- The Environmental Protection Agency: In 1994, the Environmental Protection Agency (EPA) was legally founded (Act 490). It is Ghana's top government agency for preserving and enhancing the environment. The EPA directs development to prevent, mitigate, and eradicate pollution and activities that have a negative impact on human health (Eshun & Okyere, 2017).
- The Forestry Commission: The conservation, management, and coordination of policies pertaining to the exploitation of forest and animal resources fall within the purview of

Ghana's Forestry Commission. The Commission represents the several government organizations that were carrying out the duties of managing, protecting, and regulating forest and animal resources independently (Eshun & Okyere, 2017).

- Water Resources Commission: Act 522 of 1996, a Parliamentary Act, established the Water Resources Commission (WRC) as the main agency in charge of managing Ghana's water resources. The Water Resources Commission's mandate is to precisely manage and regulate the use of water resources and coordinate pertinent government policies in this regard (Eshun & Okyere, 2017).

Another important thing to highlight is the premise of the constitution in relation to mineral resources and land management. Ghana is a democratic nation that is governed by a constitution, which serves as the foundation for all aspects of governance in society. The constitution defines the extent and roles of actors in managing resources and services, including minerals. The mineral law, as enshrined in the constitution, is the primary authority for any legal action related to the management of mineral resources in Ghana. Therefore, it is essential to explore the principles of the law and what it implies for the decision-making process and operations.

During the post-independence reforms to legalize small-scale mining and regulate the benefits of large-scale mining and investments, the constitution entrusted the central government with the responsibility of effectively managing all mining-related activities, and further reinforced by the first Mineral Act (Act 126), which stated that mineral ownership was vested in the president, who was expected to oversee its management and ensure that its benefits were distributed to the general population through developmental projects (Asori et al., 2022). This provision was upheld in subsequent versions of the Mining Acts, including the Minerals and Mining Law of 1986, and revisions in 1993 and 2006. This provision gives the state's executive arm of government control over not only lands and mining territory but also over who has access to mineral resources (Ofori, 2015). Rural people have expressed their concerns that the government's power in controlling resources and making decisions has reduced the influence of the chief and community members in decision-making processes. Aryee et al. (2003) also reiterate that the implication of the Act is that the president possesses the power to make decisions regarding the management of lands, including those owned by communities and presided over by their respective kings and chiefs. It is worth noting that, since the adoption of the 1992 Constitution of the republic, three different

Presidents have used their power to either ban or lift the ban on galamsey in a bid to preserve the environment and protect vital ecological resources like the rivers (Ali, 2022).

2.3.1 Integrated Water Resource Management Plan

Integrated Water Resources Management (IWRM) is a process that promotes the coordinated development and management of water, land and related resources in order to maximize economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (UNEP, n.d). The WRC recognizes the importance of water resources as an ecosystem that contributes socially and economically to national and local development. Since the inception National Water Policy in 2007, the integrated water management plan was drawn for the major rivers in the country under the WRC Act 522 of 1996 to “propose comprehensive plans for utilization, conservation, development and improvement of water resources”. In recognition of the various factors that account for the degradation of the Ankobra basin, especially Large-scale and ASM, the Ankobra IWRMP was drawn. WRC created a decentralized IWRM structure through a multi-stakeholder participatory and consultative process, and establishment of the Ankobra Basin Board, planning and executive units of the District Assemblies and WRC’s Ankobra Basin office in Tarkwa (serving as secretariat for the Board) (WRC, 2009).

Figure 2. shows the institutional set up of the Ankobra Basin IWRMP and the various stakeholders that are involved in the utilization and management of the river.

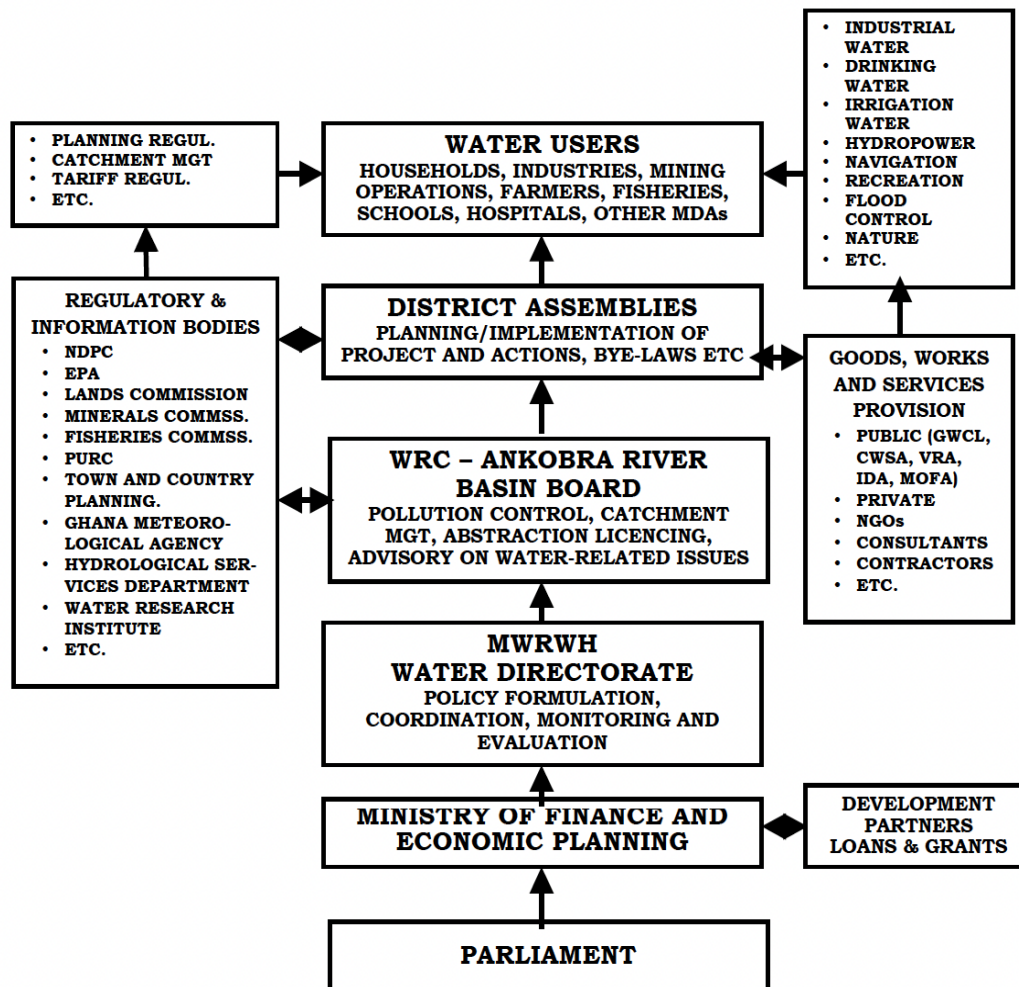


Figure 2. Institutional setting of the IWRMP Ankobra²

2.4 Discourses on illegal small-scale mining in Ghana

While fASM has contributed to development in several ways as mentioned in previous sections, iASM has recently received significant attention due to its negative effects on the environment, economy, and society. This informal nature of operation in the sector has resulted in hazardous practices, such as the use of toxic chemicals, which cause environmental degradation and water pollution. Illegal mining has also been linked to soil erosion, deforestation, and the destruction of wildlife habitats and impact on locally based livelihoods (Asare-Donkor &

² The Integrated Water Resources Management Plan was published in 2009 by the Ghana Water Commission. See link to the document <https://www.wrc-gh.org/documents/reports/>

Adimado, 2016; Banchirigah, 2008; K. J. Bansah et al., 2018; Boadi, Nsor, Antobre, & Acquah, 2016).

2.4.1 Factors characterizing ASM

In their contributing paper on the discourse of the socio-economic analyses of illegal mining in Ghana, K. J. Bansah et al. (2018) discusses five main factors that have influenced the practice of galamsey: economic, social, regulatory, technological, and political.

Economic factors include poverty and high levels of unemployment, which drive people into informal ASM as a source of livelihood. Informal ASM has been a tradition in many rural communities for over 100 years and is seen as a subsistence mechanism (Aryee et al., 2003). Wealthy individuals also participate in informal ASM as sponsors, investing in the activities and buying the products at discounted prices. In some communities, dislocation of farmers by large-scale mining companies has also contributed to poverty and forced farmers to engage in informal ASM (Banchirigah, 2008; Hilson & Potter, 2005).

Social factors include the marginalization of informal ASM workers by the government and multinational companies who operate on their lands. This has led to a feeling of social exclusion and the belief that they are entitled to the land they work on, which in turn has made government interventions to end informal ASM unsuccessful (Andrews, 2015; K. J. Bansah et al., 2018).

Regulatory factors include bureaucratic hurdles in acquiring a small-scale mining license, making it difficult and expensive for iASM workers. Delays in the licensing process, lack of prospecting data, and the ready market for the sale and purchase of minerals also contribute to iASM (K. Bansah, Yalley, & Dumakor-Dupey, 2016). Inadequate enforcement of existing small-scale mining laws is also a contributing factor, due to poor monitoring, inadequate staffing, and lack of logistics (Hilson & Potter, 2005).

Technological factors include the widespread use of heavy earthmoving equipment and improved mining technology, which has made the work less labor-intensive and increased the scale of mining (Aryee et al., 2003). In some cases, miners have even used excavators and lighting systems to operate at night to evade security forces. The introduction of the Chang fang machines since the influx of Chinese immigrant miners for processing the ore has increased production, though it has reportedly caused significant environmental pollution (K. Bansah et al., 2016).

Political factors include the involvement of political elites in informal ASM, who often provide cover for illegal operations and sell minerals on behalf of informal ASM workers. In some cases, the lack of clear policy direction and political will to enforce existing small-scale mining laws has also contributed to the growth of informal ASM. The influence of political figures in the galamsey operations has been well documented and broadcasted in the media in recent times (Amoako, Adarkwa, & Koranteng, 2022). The most recent one is the alleged involvement of a District Executive Officer arrested on suspicion of obstructing police from retrieving an excavator that was missing after it was seized over galamsey activity ([link 1](#)).

2.4.2 Ban on Galamsey

In addition to the numerous documents on the adverse impact of illegal mining on resources such as water bodies and agricultural lands, and the recent influx of foreign investments in artisanal small-scale mining, the ban on illegal mining by the government and its related issues have been the main public discourse on galamsey operations in Ghana. Over the years, the government of Ghana has consistently resorted to banning galamsey operations as a means of mitigating its destructive impact on natural resources (a top-down approach). For instance, a ban was imposed in 2006 and briefly lifted after military intervention was successful in regulating galamsey activities. Similarly, in 2013, the government declared a ban on all artisanal small-scale mining operations and deployed military forces to enforce the ban (Hilson, 2017; Tschakert, 2009a).

The recent ban on galamsey was similar to previous ones, but this time it was largely influenced by the media and NGOs. In early 2017, there was public outrage against galamsey, amplified by City FM media launching a petition supported by other media outlets and NGOs to force the government to act. The Africa Centre for Energy Policy also issued a statement in support of the national consensus to deal with galamsey, further strengthening what had come to be called the #StopGalamsey campaign (Hilson, 2017). The petition was successful and resulted in the government declaring a ban on all ASM activities. They further formed an Inter-Ministerial Committee on Illegal Mining and employed security services to fight against illegal small-scale mining. These efforts led to the arrest of over 1,000 illegal miners and the destruction of illegal mining equipment, resulting in a 75% success rate in stopping galamsey activities; stated a press release by the Minister of Lands and Natural Resources ([link 2](#)).

The ban on illegal small-scale mining was initially planned to last for 6 months but it was later prolonged until 2019, which was a first in terms of the duration of a ban on ASM. In that period, several issues concerning corrupt activities of political leaders, foreigners, military personnel and traditional rulers were reported ([link 3](#)). Three years after the lifting of the ban, the measures implemented by the government to regulate artisanal small-scale mining have not been very successful. In 2021, the Minerals Commission introduced the Community Mining Scheme in an effort to address the issue of illegal mining and promote responsible and sustainable practices among local communities. This scheme is designed to involve communities and improve their livelihoods. To participate in the Community Mining Scheme, individuals must meet the requirements outlined in the Minerals and Mining Act (Act 703 of 2006) (MINCOM, 2021, p. 6).

- Members must be citizens of Ghana
- The scheme must be organized under a body corporate, co-operatives or partnerships and sole proprietors based in the community
- Members must hold valid company registration documents
- Members must have obtained the requisite licenses, permits, and any other authorization from relevant regulatory bodies
- Members must demonstrate capacity to invest a minimum capital of GHS 100,000 (subject to review over time)
- Members must maintain a buffer zone from water bodies prescribed by (WRC)
- Members must also not discharge or cause to be discharged any toxic chemicals into natural drainage during mining and processing.

2.4.3 Institutional Informalities and Corruption

As seen in the previous section, a legal framework exists for mining operations and institutions set out to oversee these activities but this has not been functional. This is explained by some scholars as defect in the system of government in general for those countries that practice neopatrimonialism. Neopatrimonialism is a concept that describes the post-colonial state in Africa and is characterized by informality and corruption (Crawford & Botchwey, 2017). It combines traditional patrimonial rule with legal-rational bureaucracy and is marked by clientelism, a network of patron-client relationships that uses state power and resources to generate loyalty (Erdmann & Engel, 2007). Studies have shown that states that practice neopatrimonialism are prone to

institutional deficiencies such as corruption and informalities where informal rules and norms take precedence over formal institutions, and leaders use bureaucratic offices for personal wealth and status.

Bratton and Van de Walle (1994), studied 40 African states, including Ghana, and concluded that neopatrimonialism is a fundamental aspect of African politics. Crawford & Botchwey also reveal that the iASM sector in Ghana reflects the kind where there are regulations for formalization and best practices as regulated by institutions, but it only works on paper not in reality because the society operates on entrenched informal rules and norms. Guliyev argues, “.... In many respects, characteristics of the neo-patrimonial state are what we continue to observe here. Formal rules and public bureaucracies do ‘ exist and matter’, but the reality of the neo-patrimonial regime is that ‘informal rules and norms take precedence over formal institutions’ (Guliyev, 2011, p. 578). In this case, a formal legal framework regulating small-scale mining exists along with state institutions to uphold the law, yet it is a legal framework that has limited functionality and often acts as a pretense behind which informal and at times illegal practices operate. According to Crawford and Botchwey (2017), this form of government encourages corruption because individuals frequently disregard the basis of the law. Since iASM is illegal, it fosters a culture in which individuals in positions of authority profit without regard for legal standards and accountability. Blundo and Olivier de Sardan (2006) differentiate between the real and official functions of the state and argue that the state’s “real function” is usually informal and facilitates corruption by public officials and private accumulation. According to recent reports, some top government officials were allegedly found to be involved in the galamsey business, resulting in their immediate removal from office. ([link 4](#))

The increase in foreign investments in ASM is also a significant contributor to the increase in illegal mining activities resulting from informalities and corruption. According to Crawford and Botchwey (2017), the rapid increase in foreign investments in the ASM has resulted in intensification and mechanization, damage to the environment, and a lack of legal accountability. China’s investments in labor, technology, and finance are among the most notable foreign investments. The rise in gold prices and China’s economic boom made it possible for Chinese citizens with reduced incomes to borrow money to invest in ASM. These foreigners have collaborated with officials at both the local and national levels, allowing them to engage in illicit mining practices (Antwi-Boateng & Akudugu, 2020; Bofo, Paolo, & Dotsey, 2019; Crawford &

Botchwey, 2017). Currently, some Chinese immigrants are facing charges for illicit gold mining in Ghana, including the purchase and sale of minerals without a license and possession of counterfeit Ghanaian IDs ([Link 5](#)). Crawford and Botchwey report instances in which government officials, such as the immigration service, police, and politicians, shielded illicit Chinese miners in exchange for campaign contributions. In addition, they reported that the Chinese miners paid both high-level and lower-level government officials and were protected by them. During the 2017 ban on ASM activities, the Inter-Ministerial Task Force was charged with patrolling galamsey sites and arresting galamsey workers. However, the Chinese miners allegedly paid members of the Task Force to avoid arrest.

2.5 Impacts of illegal mining on Local Livelihoods

Rural livelihood, according to Chambers and Conway (1992) refers to the ways in which people in rural areas gain a living and access the means necessary to meet their basic needs. They introduced the idea of sustainable rural livelihoods to understand and address poverty and vulnerability in rural communities. Carney (1998) expanded the definition of livelihoods to include the capabilities, assets, and activities necessary for a means of living. This includes not only tangible assets such as financial resources and physical capital, but also intangible assets such as social capital and human capital.

A lot has been written on the political, social and environmental impacts of illegal mining activities in local communities in Ghana but there is still not extensive research on how this has impacted livelihoods. Many communities where galamsey is carried out rely on both forest-based resources and fishing as sources of income. In recent years, galamsey has become a significant contributor to rural livelihoods, driven by factors such as unemployment, poverty, and the absence of alternative jobs. A study conducted by Ali (2022) found that galamsey provides a higher income for rural residents than traditional activities like farming and fishing. As noted by Andrews (2015) alternative livelihood programs presented by the government and NGOs in these communities are often not feasible, leading people to turn to galamsey as a more reliable source of income. Galamsey further creates indirect employment opportunities for local workers such as goldsmiths, women carriers, panners or washers, carpenters, steel benders, and masons, allowing them to earn an income (K. J. Bansah et al., 2018).

Although galamsey has provided an income source for some local residents, it still poses a threat to their well-being. Studies by Banchirigah have shown that galamsey has led to increased incidents of prostitution, alcohol abuse, conflict, and the spread of diseases such as HIV/AIDS in the communities it operates in (Banchirigah, 2008; Tschakert, 2009a). Additionally, Ali's research highlights the negative effects of galamsey on non-timber forest products (NFTPs), reduced access to land, destruction of agricultural land, and a rise in food prices. The galamsey activities have also had a detrimental impact on soil fertility, making farming both more expensive and challenging (Ali, 2022).

2.6 Collaborative Management

From pre-colonial periods to the present, Ghana's management of natural resources, especially water bodies, has gone through several stages. Pre-colonial communities used taboos, norms, and practices as socio-cultural techniques to safeguard and conserve natural resources (Osei-Owusu & Frimpong, 2019). These standards were partially abandoned during colonial times and after independence, which prompted environmental reforms and the creation of governmental bodies to control and manage the use of water resources, including the Environmental Protection Agency (EPA), Water Resource Commission (WRA), and Ghana Water Company (GWC), among others (Gyau-Boakye & Biney, 2002). However, some of these taboos and norms continue to be used by chiefs and traditional rulers to stop their lands from being exploited.

The Community Water and Sanitation Agency (CWSA) was established as an autonomous organization to manage rural drinking water resources and implement the national strategy for community water and sanitation. This was done to promote decentralization at the district and community levels (Samuel et al., 2019). Community-based Natural Resource Management (CBNRM) was developed in response to the shortcomings of centralized, top-down approaches to rural development and natural resources protection. Central governments often treat natural resources management as a means of exerting control and promoting industrial growth, but these top-down systems are plagued by delays, poor management, and other shortcomings. Despite independence, many Sub-Saharan African nations still use a centralized structure for managing natural resources and other aspects of their economies (Agrawal & Gibson, 1999).

The only community-based management platform established by the government is the Community Resource Management Areas (CREMAs), which aim to bring together communities

sharing common resources and manage these resources jointly. However, this approach has not specifically addressed the management of water bodies, unlike its focus on protecting forests and wildlife, particularly considering the increasing problem of galamsey (Osei-Owusu & Frimpong, 2019). Various strategies have been implemented over the years to curb environmental degradation and pollution of waterbodies, especially from galamsey. Most of these approaches, however, have not achieved the intended outcome and call for an effective approach that ensures community inclusion in decision-making. These top-down approaches receive resistance from communities because they view it as a suppression of rights since they exploit the resources as a means of livelihood (Aubynn, 2009b; K. J. Bansah et al., 2018).

Table 1. Approaches used to eradicate ASM in Ghana

Measures	Description	Comments
Formalization (Aubynn, 2009; Bansah et al., 2018; Tsikata, 1997)	Legalize ASM activities under certain conditions	Resulted in more licensed ASM projects but has failed to tackle iASM due to bureaucracies and informalities in registering.
Traditional methods (Abeku Essel, 2020; Appiah-Opoku, 2007; Osei-Owusu & Frimpong, 2019)	Superstitions and taboos restricting communities from any harmful activity in waterbodies	Successful during the pre-colonial era and faded out with time during and after colonization of Ghana
Community Development (Tschakert, 2009b); Aryee, Ntibery, & Atorkui, 2003; Bansah et al., 2018)	Provision of alternative livelihood programs for communities, technical and educational support	Unsuccessful because they are usually less profitable as compared to ASM and they are not managed well
Repressive approach (Ali, 2022; Banchirigah, 2008; Crawford & Botchwey, 2017)	Imposition of ban on all ASM and deployment of military task force to arrest and confiscate machines used in the activities	Top-down approach, Cost intensive, conflicts among stakeholders and usually only succeed for a short period and iASM resumes
Collaborative approach (MINCOM, 2021)	Bottom-up approach that involves multi-stakeholders and ensure local inclusion in decision making	Hasn't functioned effectively, and the newly introduced Community Mining Scheme has is yet to be evaluated.

Adopted from Hasibuan, Tjakraatmadja, and Sunitiyoso (2021)

As shown in the table above, collaborative management approach is one that has not been well adopted by the authorities in dealing with the mass water pollution caused by galamsey activities in Ghana, hence necessary to explore the usefulness and evaluate the recent efforts of the Ministry of lands and resources to include local voices in decision making as well as giving them a legitimate platform for mining according to regulatory standards. The idea of collaborative

management between the government institutions at various levels and the local people rests on the assumption that these negotiations can promote pluralism, good governance, and conflict resolution, enhance sustainability and improve local livelihoods (Borrini-Feyerabend, 2014). This is not a new idea, but it continues to be extremely challenging to implement successfully, especially in Africa. As posited by Seshia (2002), Community-Based Natural Resource Management involves a decentralized process to give grassroots institutions the power of decision-making and the right to control their resources.

2.6.1 Multi-Stakeholder Group for good sector management

In resource-rich regions like sub-Saharan Africa, the governance systems make it challenging to effectively manage natural resources. This is due to factors like weak government institutions that perpetuate corruption, and informal social structures that undermine the effectiveness of decentralized systems at the local level. To address these issues, it is suggested that an independent multi-stakeholder group be formed through consultation at all levels to counteract the influences and informalities in natural resource management.

In recent times, international standards for sector governance are being developed with the influence of non-state actors such as businesses, international organizations, community representatives, and researchers (Peters, Koechlin, & Zinkernagel, 2009). Issues that used to be addressed only at the national level, like pollution, wildlife protection, and anti-corruption, are now seen as global problems that need international attention. As suggested by Søreide and Truex (2013), the role of governments in creating standards for governance and sector operations has diminished. To address these issues, international organizations and donors are promoting collaboration among stakeholders in the natural resource sectors to improve performance, build public confidence, increase accountability, and establish legitimacy.

Multi-stakeholder processes aim to promote dialogue, negotiation, learning, and decision-making by bringing together various stakeholders. These processes aim to link grass-roots actions with top-down policies. Typically, a group of stakeholders works together to achieve a common goal through collective action, such as setting higher standards in the sector or reducing resource mismanagement by providing public access to information (Søreide & Truex, 2013). Hemmati (2012) defines multi-stakeholder processes as ‘processes that aim to bring together all major

stakeholders in a new form of decision-finding (and decision-making) on a particular issue'. In their framework, Søreide and Truex (2013) provides a conceptual distinction between

- (i) multi-stakeholder forums for dialogue – with opportunities for learning and joint understanding;
- (ii) multi-stakeholder platforms – established for stakeholders to bargain over the generation of policy; and
- (iii) the formation of multi-stakeholder groups with a mandate (MSGs) – tasked with policy implementation/oversight and requiring some form of joint action and decision-making.

In Ghana, steps (i) and (ii) have been taken but have not been very successful due to political governance issues. It would be better to suggest the formation of a locally inclusive group (MSG), which would be responsible for creating policies, regulations, monitoring progress, and making decisions. Søreide and Truex (2013) suggests that the multi-stakeholder group approach is ideal for countries where laws and regulations exist but are not consistently enforced and where there is a willingness to make new laws. Ghana is a suitable candidate for this framework, as regulations are regularly updated, and the public is motivated to address the negative impacts of galamsey on the environment and livelihoods.

Chapter Summary

The chapter provides an overview of the major discussions regarding the topic of ASM in Ghana, including its historical background and legal framework. It examines the reasons behind iASM practices in Ghana and analyzes the discussions surrounding its operationalization including its impact on local livelihood. iASM is understood as dangerous to the environment and also reveals the informalities inherent government structures. The chapter also explores the approach of involving multiple stakeholders in managing resources collaboratively. Despite the existence of a tentative legal framework, the management of ASM in Ghana has been unsuccessful due to the social structures and norms that regulate institutional functions. This has produced power among stakeholders, with those in authority using it for their own benefit. While a collaborative framework could guarantee the participation of all stakeholders, it is essential to comprehend these power dynamics and how they manifest in everyday interactions. The theoretical foundation of power in natural resource management is

discussed in the following chapter and offers an understanding of how power influences behavior and decision-making.

CHAPTER THREE

3. Theoretical Framework

Introduction

This chapter sets out the theoretical foundation for organizing and understanding the key concepts of the study. In identifying areas of power and how it is produced, distributed, and reproduced among actors in the governance of the Ankobra basin, relative to the aim of the study, a political ecology approach is utilized to excavate the power relations among these actor groups across different scales and structures that provide the basis for its production. To begin, I present some contributions in political ecology literature to understanding environmental governance, pointing how power is a focal point in their conceptualization. Then I further explain the main approaches power has been understood in natural resource management, highlighting the empiricist and realist perspectives. This provides a foundation for situating how actors exercise power within social structures. I then conclude with a discussion of collaborative management in natural resource governance through multi-stakeholder group reforms that ensure the effective inclusion of the local people in the management of the Ankobra river.

3.1 Political Ecology Theory

Political ecology, used in several disciplines, has different meanings and definitions depending on the angles of emphasis over time. Some contributions to defining political ecology stress political economy, others point to more formal political institutions, some stress environmental change, and others emphasize narratives or stories about environmental identities (Robbins, 2011). For the purpose of this work, the definition of political ecology are inspired by the early works of Greenberg & Park, who define political ecology as “a synthesis of political economy, with its insistence on the need to link the distribution of power with productive activity and ecological analysis, with its broader vision of bio-environmental relationships” and that of Watts as “to understand the complex relations between nature and society through a careful analysis of what one might call the forms of access and control over resources and their implications for environmental health and sustainable livelihoods” (Greenberg & Park, 1994, p. 1; Watts, 2000, p. 257).

Generally, questions political ecologists ask or seek to answer can be grouped under five dominant narratives; degradation and marginalization, conservation and control, environmental conflict and exclusion, environmental subjects and identity, and political actors and actors (Robbins, 2011). He also establishes that the discipline explores social and environmental changes with an understanding that there are better, less coercive, less exploitative, and more sustainable ways of doing things. According to Bryant, “political ecologists accept the idea that costs and benefits associated with environmental change are for the most part distributed among actors unequally . . . [which inevitably] reinforces or reduces existing social and economic inequalities . . . [which holds] political implications in terms of the altered power of actors in relation to other actors” (Bryant & Bailey, 1997, p. 28). Thus, this theory provides a methodical and thorough basis for unearthing the political processes between various actors that have contributed to the pollution of the Ankobra river, provides a concrete understanding of the inequalities in decision-making, and subsequently helps in suggesting an effective management system that recognizes and utilizes the power stakeholders possess to sustainably use the river and its associated resources.

At the core of political ecology literature in natural resource management is the “resource curse” concept. This is the primary issue facing the management of extractive industries in resource-rich areas. This concept suggests that natural resources can negatively impact a region’s overall well-being. To measure the effects of the resource curse, experts may examine factors such as the abundance of resources and economic growth. However, one key factor that contributes to this problem is corruption in governance. Specifically, weak institutions in some countries can lead to higher levels of corruption, especially in cases where there is a large amount of resource wealth at stake. Research by Pendergast, Clarke, and Van Kooten (2011) found that a country’s regulatory quality can have a positive impact on controlling corruption, even in cases where the resource curse is present. This is important because governments may be tempted to use resource rents for personal gain, which can make it even more desirable to hold political power. To overcome the resource curse, Mauro suggested that reforms must be implemented at the highest level of government. This may involve improving institutions, increasing transparency, and implementing policies that promote sustainable development rather than just maximizing short-term gains from resource extraction (Mauro, 1998). This thesis investigates how the Ankobra river as a resource has impacted the livelihoods of local communities along it and reviews the governance system and strategies responsible for the current inequalities in managing the resource.

3.2 Power in Natural Resource Management

Robbins' explanation of the research and contributions to political ecology sets the tone for the section. Rather than defining political ecology, he posits that the “nature of the community [political ecologist literature] and the quality of texts, as well as the theory and empirical research that underpins them, ...broadly can be understood to address the condition and change of social/environmental systems, with explicit consideration of relations of power” (Robbins, 2011, p. 20). As revealed in previous section, power plays a key role in definitions of political ecology. According to Svarstad, Overå, and Benjaminsen (2018, p. 351), “empirical studies within this field tend to provide detailed presentations of various uses of power, involving corporate and conservation interventions influencing access to land and natural resources”.

Ribot and Peluso (2003, p. 156) offered a coherent definition of power as a synthesis of agency of individuals, structures, and Foucauldian power perspectives on knowledge and discourse. They defined power, first, as “the capacity of some actors to affect the practices and ideas of others ... and second, [that] power ... [is] emergent from, though not always attached to, people...Disciplining institutions and practices can cause people to act in certain ways without any apparent coercion”.

Power theories in natural resource management can be conceptualized under two main perspectives;

- Empiricist Perspective
- Realist Perspective

This research combines the understandings from the empiricist approach, specifically the works of Steve Lukes power relations and Jeffery Isaac's realist (post-structural) perspective of power as it relates to natural resource management and which view power as the capacity of agents to act within preconditioned, organized social connections. Even though this study deploys a realist perspective to power, it is imperative to outline the main arguments of the most dominant arguments of the empiricist view of power which will better give an understanding of how power has been exerted by dominant actors over marginalized groups, while the post-structural perspective provides a better foundation to understand the management systems as one that consists of power individuals possess and the social norms which allow its production in Ghanaian gold mining and water pollution of the Ankobra river.

Table 2. Summary of the perspectives of Power applied in NRM

Understanding of Power	Main perspectives and contributions	Implication for NRM
Empiricist	<p>Agent-centered perspectives Power as coercion A has power over B to the extent that he can get B to do something that B would not otherwise do (Dahl, 1957; Lukes, 2005)</p>	<p>Powerful individuals often have the authority to make decisions regarding resource use by local people which often receive resistance</p>
	<p>Power as constraint Power is exercised to constrain the actions or possible actions of B (Bachrach & Baratz, 1970)</p>	<p>Powerful individuals and institutions limit the inputs by other stakeholders in decision-making that may be contrary to their personal gains.</p>
	<p>Structural perspective Power as consent production A exercises power over B when A affects B in a manner contrary to B's interests (Lukes, 2005)</p>	<p>Powerful individuals gain consent from other stakeholders through practices that will result in their interest including control of information.</p>
Realist	<p>Post-structural perspectives Power as capacity - Human agents exercise power within preconditioned, structured social relations (Giddens, 1984; Isaac, 1987)</p>	<p>Powerful individuals take advantage of their social position, structures and norms which ensure inequality existing already to maneuver their way in decision making</p>
	<p>Foucauldian perspectives Power as discursive, use of governmentality, and biopower (Foucault, 1991, 1994; Foucault & Gordon, 1980; Hajer, 1995)</p>	<p>Powerful individuals exercise power through the establishment of discourses on issues and narratives on the use of specific resource in ways that are suitable to themselves. Government, e.g., can influence citizens to act in accordance with policies through disciplining.</p>

3.3 Empiricist Perspective of Power in Natural Resource Management

The simplest way of understanding the various dimensions of power in natural resource management is the *agency* view. Usually described as “power over”, which implies a form of coercion, Steve Lukes describes this as the *first dimension* of power in his work. This form of power is understood in the simple illustration by Dahl as ‘ A has power over B to the extent that s/he can get B to do something that B would not otherwise do’ (Dahl, 1957, p. 203). As suggested by Raik, Wilson, and Decker (2008), many discussions of power in natural resources are limited to the discourse of power as coercion, mainly because of negative consequences related to the creation of protected areas. Isaac explains that this form of power can be empirically measured and observed as it is rooted in behaviorism and a relation of cause and effect (Isaac, 1987).

The *second dimension* of power in the Agency view is proposed by Bachrach and Baratz as exercised when agent A constrains the action of or possible actions of B. Power as constraint by them happens when “A devotes his energies to creating or reinforcing social and political values and institutional practices that limit the scope of the political process to public consideration of only those issues which are comparatively innocuous to A” (Bachrach & Baratz, 1970, p. 7). This dimension rests on the idea of modernization of bias, which means that agents in power not only control active decision making, but they can also ensure the inactions of issues. Hence, analysis of power requires examining both decision-making and non-decision-making, where a nondecision is “a decision that results in suppression or thwarting of a latent or manifest challenge to the values or interests of the decision-maker” (Bachrach & Baratz, 1970, p. 44; Raik et al., 2008).

These agent-centered perspectives however restrict individuals as possessors of power and ignore the social conditions in which certain individuals exist. Hence can be limited in understanding the dynamic and pervasive nature of power as suggested by Raik et al. (2008). This argument opens the discussion for the *third dimension* of power, i.e., the structural view.

The structural perspective of power understands power as “forces above and external to the individual (e.g., race, gender, class) that operate unacknowledged to influence people and their behavior” (Raik et al., 2008). Power no longer resides within individuals; it emanates from structural forces. Lukes’ redefinition of power as the third dimension posits that A exercises power over B when A affects B in a manner contrary to B’s interests. Individuals exercise power over others because of their position in social structure. The production however is inherent in what he defines as subjective interests (interests that can be articulated by agents) and objective interests (interests that are not articulated). Consistent with his earlier charge, the third dimension seeks to answer the “What would B have done had it not been for A’s power? This question is addressed by the concept of objective interests: ‘true’ interests that may go unarticulated and unrecognized by the individual, but are shaped through social-structural processes (Lukes, 2005).

The third dimension of power is therefore the social-structural production of consent and norms. This means that the exercise of power in current management practices and decision-making concerning natural resources (status quo) is maintained not through the actions of individuals but through the practices and rituals of groups and institutions. “Societal forces shape individual preferences, and this shaping process works to justify and maintain current systems of power” (Raik et al., 2008, pp. 734-735).

Even though these empiricist views provide a case for how decision-making on galamsey and water management is done in the Ghanaian context, it does not provide a synergic interpretation of the discourse because it fails to account for power as both consisting of agency (individual actions of those in power) and the social-structures and practices that maintains the status quo and social systems. The assumption that social systems create a *false consciousness* among the dominated is a main critique to the structural view as false consciousness is not equally applied to all individuals (Raik et al., 2008). For instance, Lukes (2005, p. 38) asserts that ‘people’s wants may themselves be a product of a system which works against their interests’. Thus, people participate in social processes whereby they (the subordinated) not only act in ways contrary to their interests, but they do not even perceive their objective interests. Based on the shortcomings of the empirical approaches, I deploy the realist approach to understanding power in the Ankobra pollution context to provide a synergy between agency and social structures that defines decision-making and management of the resource.

3.4 The Realist Perspective of Natural Resource Management

Indeed, much attention has been given to the empiricist perspective (agent/structure dualism) as it provides what I describe as a partially biased view depending on the kind of agent or social system that the writer intends to magnify in his/her propositions. It is no surprise that there is not enough literature on the galamsey discourse from a realist point of view, and in the natural resource management scholarship.

Although the agency–structure relationship is fundamental to understanding power, Giddens (1984) suggests that this relationship is not necessarily a reified dualism between agency and structure. “The realist view is based on identifying enduring structural preconditions that shape contingent human interaction... provides a relationship between individual agency and social structure from which to understand the workings of power and conduct analyses” (Raik et al., 2008, p. 736). The realist view provides a synergy between the agent/structure dualism and argues that both depend on each other and should be analyzed not as separate units.

In this thesis, Isaac’s definition of social power is used to understand what power implies. Inspired by Rom Harre’s “Powers: British Journal of the Philosophy of Science”, where power is seen as a causal concept and not contingent effects, Isaac argues that power should be ascribed to social agents. Where agent’s intrinsic nature (social identities as participants in enduring, socially

structured relationships) becomes the focal point of explanation (Isaac, 1987, pp. 74-75). There are many arguments to Isaac’s post-structural conceptualization of power, but I will only consider three main proponents for this work which are Power and agency, social power and social structure, and Power and domination.

Table 3. Key Concepts of Isaac’s Power theory

Key Concepts	Main arguments	Application for this thesis
Agency	An agent’s power is what they can do based on the norms accepted in the society rather than the outcome of actions.	<ul style="list-style-type: none"> • Agents and their interests in the resource utilization • Capacities of the actors in decision-making on mining and water management
Social Power and Structures	Historical and enduring relations between social agents shape how power plays out in social interactions	<ul style="list-style-type: none"> • Embedded socio-cultural practices and systems such as constitution and policies • Discourses surrounding the galamsey activities and local-based livelihood of the communities.
Domination	Domination is an asymmetrical distribution of power where which does not conform to the normal social relation.	<ul style="list-style-type: none"> • Representation of various stakeholders in decision making • Institutions, bureaucracies, and social positions that ensure inequalities

As shown in Table 2, Isaac presents a compelling argument that challenges the traditional understanding of power as a specific type of action that one individual or group can use to influence another. In explaining power and agency, Isaac argues that power is a capacity that is embedded in all social life and is manifested in an agent’s ability to engage in intentional activities and adhere to normatively constituted practices. According to Isaac, an agent’s power is defined by what they can do, rather than being an antecedent cause of a particular outcome. This perspective emphasizes the importance of understanding the norms and practices that define an agent’s activities, rather than simply focusing on the outcome of those activities (Isaac, 1987, pp. 75-77). For instance, instead of asking how a specific group gains power to engage in illegal mining, Isaac suggests investigating the norms and practices that underpin their activities and the capacities required to engage in them. This approach provides a more nuanced understanding of power that recognizes its complex and multifaceted nature and highlights the importance of investigating the broader social and cultural context in which power is exercised.

He further argues that social power should be viewed in a rational manner, which means that it should be understood based on the underlying social relations that structure interactions between individuals. Rather than viewing power as a contingent regularity of behavior, it is important to draw insights from the historical and enduring relations between social agents. According to Isaac, social power refers to the capacities possessed by social agents to act, which are derived from their participation in enduring relations. Using the education system as an example, Isaac explains that the social identities of teachers and students are inherently connected and in relation to one another. These social identities influence decision-making processes, not through a causal effect but through pre-existing, defined relations.

Rather than following the crude definition of power as “power over,” implicating that some actors have power over others, Isaac considers power as an important component in all social interactions, but domination is not a necessary feature of society. The concept of domination in this view is seen as an asymmetrical distribution of power where the capacity to act among agents in the normal social relation is not distributed symmetrically. Isaac defines domination as a “structurally asymmetrical relationship, whereby one element of the relationship has power over another in virtue of its structural power to direct the practices of the other” (Isaac, 1987, p. 84). Weber contributes to this realist view of modern bureaucracy as a form of domination, and that certain socially positioned roles such as traditional chief, bank manager, etc., in their nature ascribe certain power over subordinates (Weber, 1978). This thesis will explore how certain bureaucracies in governance and social systems place certain actors in the position to decide the extent to which the Ankobra river is used and the limits of other actors in decision-making.

These three arguments of the realist view of power posited by Isaac will guide this paper’s discussion to give a holistic perspective of the dynamics of power in play in the management of the Ankobra basin in the two communities. It will be interesting to provide the tenets of power action by individuals in the galamsey process through existing and enduring social structures which is at the center of conceptualization in the realist approach. Relevant to this study, this theory allows for the investigation of four main indices:

- Embedded socio-cultural practices and systems such as constitution, bureaucracy, mining law, land tenure system, and government policies.
- Representation of various stakeholders in decision making
 - The ability of community members to voice their concerns

- Agents and their interests in the resource utilization
- Discourses surrounding the galamsey activities and local-based livelihood of the communities.

This investigation seeks to shed light on how systems such as policies and bureaucracies are ingrained within community and institutional systems, as well as the actions taken by various actors that contribute to the legitimization of iASM, resulting in pollution and the disruption of livelihoods. This investigation's findings have the potential to guide policymakers, community members, and other stakeholders in the development of effective strategies to address and mitigate pollution issues, resulting in a more sustainable and healthier environment for the affected communities. Participatory action is typically utilized in such circumstances, but it is essential to recognize that this strategy may inadvertently reinforce existing power dynamics among key stakeholders. Therefore, a cautious, inclusive, and locally-driven approach to participatory decision-making will be required. The subsequent chapter discusses the methods that will be used to gain a more in-depth and nuanced understanding of the key indices described in this section.

CHAPTER FOUR

4. Methodology

Introduction

This chapter focuses on the background and major characteristics of the study areas, such as location, drainage system, climate, topography, and vegetation. Additionally, the chapter explains in a systematic manner the research design and methods that were used in to prepare, collect, and analyze data from participants in the Adelekezo and Eziome communities of the Nzema East and Ellembelle Municipalities, respectively. Details are provided on how participants were selected and how data was collected, organized, and analyzed by themes. Ethical considerations of the study such as confidentiality, positionality, and reflexivity are discussed. Limitations of this study are also included in the last part of this chapter.

4.1 Background of Study areas

Formerly part of the Nzema East Municipality until it was separated as an independent district assembly in December 2007 by (LI) 1918, the Ellembelle District is located in the southern part of the western region of Ghana and forms part of the 14 Metropolitan, Municipal and District Assemblies in the region. It is located between longitudes 2°05'W and 2°35'W and latitude 4°40N and 5°20N. It has a total land size of 1,468km² (Ghana Statistical Service, 2021). With a total population of about 121,000, the district shares borders with the Jomoro Municipality to the west, Amenfi West Municipality to the north, Nzema East Municipality to the south-east, Tarkwa-Nsuaem Municipality to the east and a 70 km stretch of sandy beaches to the south. While a large portion of the total land area has vegetation cover, about 30% of the populace resides in the coastal belt. Most of the people in the district, as a result, depend on crop farming, while a large portion of the people along the coastal belt engage in fishing as their main source of livelihood. The district is rich in rock deposits, having an undulating topography with highest point of 450ft above sea level and rocks of cambrian type of the birimean formation and the Tarkwaian Sandstone-Association Quartzite and Phyllites types. These deposits contain economically valuable minerals such as gold, silica, and kaolin. The presence of these minerals in combination with the colonial history detailed above, have resulted in the perverse development and overexploitation of resources, pollution and severe socio-economic disparities in recent times.

Popular for its beautiful sand beaches and one of Ghana’s best tourist destinations, the Nzema East Municipality is located on the southern end of the region between longitudes 2°05’ and 2°35’W and latitudes 4°40’ and 5°05N and covers a total land area of 1,025km² (Ghana Statistical Service, 2021). It is bordered on the west by the Ellembelle District, on the north by the Wassa Amenfi District, on the east by Tarkwa-Nsuaem Municipality Prestea Huni Valley, Ahanta West, and on the south by the Gulf of Guinea, which has a 9-kilometer stretch of sandy beaches.

Like most south-western districts, it is rich in rock deposits with minerals such as gold, diamond, and silica. This municipality is mainly drained by the Ankobra River and its major tributaries like the Ahama and Nwini rivers. Similar to Ellembelle District, most of the residents depend on crop farming as over 70% of the working population is involved in agriculture. Some of the major crops produced in the district are coconut, oil palm, cocoa, rubber, and sugarcane. Coconut is grown extensively in the district, especially in the southern parts. The population of the people living along the estuary also depend on fishing as its main source of livelihood.

Table 4. Overview of Study Districts ³

Municipality	Population size (Appx)	Area (km²)	Administrative Center
Nzema East	94,261	1,025	Azim
Ellembelle	120,893	999.7	Nkroful

4.1.1 Ankobra Basin

The Ankobra basin covers an estimated 8403 km² spanning 11 districts in three geographical areas with Wassa Amenfi, Wassa West, and Nzema East Districts. It is located between latitude 4° 50’ N and 6° 30’ N and longitude 1° 50’ W and 2° 30’ W and is bounded to the east by the Pra Basin, to the north and west by the Tano Basin and flows about 190 km south to the Gulf of Guinea (Hen Mpoano, 2016; Osman et al., 2016). The basin falls under the South-Western Equatorial and the Wet Semi-Equatorial climatic regions with high mean annual rainfalls.

³ See the full report of the population census of district assemblies online: <https://census2021.statsghana.gov.gh>



Figure 3. Map of Study Areas (Hen Mpoano, 2016).

Figure 3 shows the map of lower Ankobra, indicating the two communities (pointed in red) which was selected for the study which aligns with the research objective of project BC5. The Ankobra Estuary was selected as a study site due to its significance to coastal ecological systems in the Atlantic Ocean, and the two communities were chosen based on several factors listed below.

1. They are two estuarian communities opposite each other and separated by the Ankobra river.
2. They are among the five (5) beneficiary communities of the government's program under the Sustainable Fisheries Project (SFP) on sustainable fishing.
3. They have the least population amongst the (5) communities and are reported to be significantly dependent on the river as a source of livelihood.

In addition to these was my curiosity about how galamsey was practiced in the communities and my desire to reach out to the communities to get primary data on my research objectives since they are remotely small communities along the river with limited access to transportation.

4.1.2 Adelekezo and Eziome

The combined population size of the communities is estimated at 1000 residents. The river contributes significantly to the livelihood of the communities by providing ecosystem services such as food and water, fish farming, transportation, cultural and spiritual value, among others, to most of the people (Hen Mpoano, 2016). It is estimated that over 40% of the population of Adelekezo community depends on agriculture and fisheries for livelihood, likely increasing to 80% during rainy seasons. These communities are downstream in the basin, and crucial as to how contaminants from upstream communities affect them through to the Gulf of Guinea (Mensah et al., 2015).

Table 5. Overview of Study Community

Community	Municipality	Population size (Appx)	Major Activities
Adelekezo	Nzema East	700	Crop farming, fishing, artisanal small-scale mining
Eziome	Ellembelle	300	Fishing, logging, cocoa farming

4.2 Research design

Community-based management rests on the premise of effective communities. Thus, if CBM is not working or absent, the dynamics of specific communities must be examined, and this is best done through a case study approach. Through detailed engagement with the two communities in the Ankobra area, contextual and in-depth knowledge on the motivations, interests, and opinions on the management and usage patterns of land and water resources were gathered.

Associated qualitative methods such as interviews, participant observation, and group discussions round out the data collection of this study.

4.2.1 Fieldwork

The geographical range of study participants was determined based on the parameters initially set out in the BC5 project. Many communities along the Ankobra Estuary have similar resource use patterns, practicing a range of livelihood activities such as farming, fishing, fish trading, and mining. A stakeholder identification was done by reviewing relevant secondary data on the utilization of the resource to which participants were purposively selected based on their entitlement, dependence, influence, and interests in managing the river and its associated services. Important stakeholder groups included local residents, traditional leaders, government representatives from management institutions, fisherfolk, and NGOs.

4.2.2 Selecting Participants

In doing purposive sampling, a variety of techniques were utilized which included criterion, snowball, and convenient sampling. Criterion sampling involves selecting participants based on pre-defined criteria, and for this study, actor groups who use or have a legal, scientific, social, or political attachment to the resource. For example, representatives from the EPA, WRC, and District Assembly were selected because of they are the agencies that work closely the pollution of the river and associated issues as part of their institutional duties. As Hay explains, snowball sampling, also known as chain sampling, identifies cases of interest reported by people who know other people involved in similar cases. In using snowball technique, participants were asked if there were other informants that have relevant information on the study topic. At the national level, I had contacts and leads to people at the regional level who also gave contacts to reach people at the district (local) level. Some of the fisherfolk also led me to their colleagues to interview them. Lastly, participants were selected based on access (convenience)⁴. This technique was especially helpful as most of the residents in the community were not available for most parts of the week until they returned on Fridays. I usually sat in the market place and conversed with

⁴ All three types of sampling techniques are explained in Stratford, E., & Bradshaw, M. (2016). Qualitative Research Design and Rigour. In I. Hay (Ed.), Qualitative Research Methods in Human Geography (4th ed.

the market women and local residents who pass-by of which some consented to be part of the study and provided interesting insights into the issue of galamsey in the communities.

4.3 Data Collection

Data was collected using interviews, group discussions, and participant observation. These methods were selected because they are interactive and help build a local collective framework that reflects the views and support of the people. Before the data were collected, participants were briefed on information on the researcher, the objectives of the study and their right to consent as required by the Norwegian Centre for Research Data (NSD).

4.3.1 Interviews

Interviews are an essential method of data collection that helps gain access to information about events, opinions, and experiences (Dunn, 2016). It helps to understand how meaning varies for people related to age, ethnicity, sexuality, and many additional dimensions of identity and culture. In accessing relevant information on the sustainable use of the Ankobra resource, an in-depth interview was helpful. Specifically, a semi-structured form of interview was used, where an interview guide was developed and revised to fit unexpected situations during the fieldwork. The flexibility of this approach allowed informants to be presented with some systemic questions while not undermining their free will in expressing or addressing pressing issues. It ensured that unanticipated events relevant to the study could be captured in the process. In satisfying the various criteria of this study, the “government institution” group specifically involved participants from the EPA at the national and regional level, an expert from the Local District Assembly, and a representative of the WRC at the basin level. The specific NGO group that was interviewed was Hen Mpoano, which has worked extensively in the community for over 10 years. “Farmers” included people who had their farms close to the river and had been farming pre-pollution of the Ankobra river. “Fishermen” included those who had their own boats for fishing in the river and had been doing that for several years before the pollution. “Traditional leaders” group specifically included Chiefs of the community, elders, and those appointed from the SFP committee that was initiated by Hen Mpoano. Lastly, the “local residents” included fishmongers (predominantly women), passers-by, people who have lived in the community to experience the change from clean river to its current polluted state.

During the interview process, some of the questions were adjusted to suit situations where participants were unwilling to answer questions posed at them. For example, some of them were reluctant to voice their opinion on the “galamsey” situation if that was the cause of the pollution or not because of some intrinsic fear of being victimized in the community as giving information about some political or traditional leaders who are alleged to be involved in the galamsey. Most of the questions were open-ended and explained in simple terms and in lighter tone for maximum participation⁵. The interviews were conducted until I reached saturation. At some point, there were repetitions of the same thing from every local resident I interviewed.

As briefly discussed above, an interview guide was used to present specific questions relevant to the study’s objectives. Questions asked differed among stakeholders but were all based on selected themes: background, perceptions of impact on livelihood, perceptions on the management of the estuary, and perceptions on collaborative management. For “government institutions and NGO” groups, they were asked specifically about the management practices they were employing, perceptions about the various actor groups, and their views on collaborative management⁶. In the semi-structured interviews, the questions only served as a guide to keep the researcher on track but were flexible in the explanation of questions. While the questions were originally written in English, for use in the field they were translated into “Twi”.

4.3.2 Focus Group Discussion

Focus group discussions were also used to gather information on the multiple meanings different groups attached to place, social issues, and perceptions about other groups in managing resources (Hay, 2016). The interactions between group members create an opportunity to explore different opinions, formulate and reconsider their own understandings. Community-Based Organizations such as farmers’ associations and fishers’ associations, the local government, community leaders, and artisan miners, among others, were targeted to define their interests and how to balance these to achieve the collective goal of sustainably restoring the resource.

A list of questions was then prepared based on selected themes and served as a guide in the discussion. As Hares, Dickinson, and Wilkes (2010) formed open-ended questions that acted as

⁵ See interview guide and approved consent form from NSD in the appendices

⁶ See appendices B & C

probes from general to specific, the themes broadly looked at perceptions on the impact of pollution on livelihood, which specifically tackled economic activities, food, and agriculture, among others.

4.3.3 Participant Observation

In addition to interviews and focus group discussions, participant observation was utilized as a supporting method in order to obtain a deeper understanding of the significance of place and context in everyday life. According to Evans (1998, p. 318), interviews may disrupt the “flow” of everyday life in both spatial and temporal dimensions due to their structured nature. Participant observation, on the other hand, aims to generate understanding through active participation in everyday interactions. It allowed for an observation of the daily life of members of the Adelekezo and Eziome communities following the pollution of the river and how this has impacted them. Moreover, the cultural, political, and socio-economic contexts of the communities were observed closely, as these factors influence the way in which individuals comprehend and respond to the situation. The purpose of this was to gain a thorough understanding of the effect that the pollution has had on their way of life. This method was a valuable approach for gaining a more comprehensive and nuanced understanding of the situation, and allowed for a more detailed exploration of the experiences and perspectives of the local communities.

4.4 Data Analysis

To ensure rigor, a data management plan (DMP) was drawn in the preliminary stages of the research as a guide to how data will be collected, analyzed, shared, and stored. As required by the NSD for research that deals with sensitive community issues, an application was made and approved for the data collection, processing, and storage⁷.

It is important that data collected in research are constructed and interpreted to make meaning. Depending on the type of methods used in collecting the data, different types of analysis are done to seek meaning out of the raw data. In qualitative research, construction of themes, relations between variables, and patterns in data are made through content analysis. Audio recordings from the interviews and focus group discussions were transcribed. Field notes taken from observation and unconsented audio recordings were documented. The transcripts and

⁷ See the approved NSD application in appendix

documents were subsequently categorized and organized through coding. Coding is an important part of textual data analysis as it helps to reduce and sort through large amounts of data collected from the participants “data subjects” (Hay, 2016). As an exploratory process for themes in the transcribed document, the codes reflected and gave deeper insight into the processes and context of phrases and actions by the subjects.

In categorizing the themes, analytical codes were used. Larger themes that were pre-determined from the research objectives reflected perceptions of participants on the impact of pollution on livelihood, conflicts in managing the estuary, and collaborative management, among others. Analytic themes in qualitative research refers to the themes the researcher is interested in, which typically goes deeper into the processes and context of phrases or actions (Hay, 2016, p. 379). For example, “corruption” was coded for phrases where participants expressed a level of injustices and instances of foul play by political and traditional authorities in the galamsey operation. While “vulnerability” refers to when participants felt there was little they could do in their power to decide on the state of pollution and its impact on their livelihood. Analytic codes are not necessarily words or phrases that are directly stated in the transcripts, but are derived and coded based on the researcher’s knowledge on the concepts and themes relevant to the study.

Even though some themes were established before the data collection from literature review, most of the codes were derived from the data collected from the participants. Deductive codes such as “power,” and “decision-making” were derived from literature on community-based management and political ecology scholarship. Inductive codes such as “corruption” however, were coherent with the reasons for uncontrolled pollution and “resistance” or “interference” by some political and traditional authorities in the fight against galamsey and pollution of water bodies.

4.5 Ethics

As Dowling (2016) remarks, methods in qualitative research cannot be separated from social structures because the main idea of the research is to interpret information collected from the society (people), which demands interaction with them.

Illegal mining is currently a sensitive societal issue in Ghana. As a result, the confidentiality, anonymity, and privacy of participants' information were prioritized. Questions posed to participants were directly related to the research objectives, and participants had the option not to answer any question or withdraw from the project at any time, in accordance with NSD guidelines. More significantly, a careful approach was taken to avoid "harm". In seeking the participants' views on sustainability, offensive language such as villagers, criminals, poor people, and uneducated, were avoided, especially as galamsey workers have been perceived as "criminals". Informal artisan miners have been pinned in the media and some articles as deviant to societal norms and values, resulting in hostile actions and ways of thinking. It was important not to paint the same picture while extracting relevant information from them, which was essential for discussion and analysis in the project. Relatedly, Chinese businesses and Chinese labor migrants have come into Ghana in relation to the growth in the mining sector in the last few decades. This has led to complicated and tense interactions and growing prejudice. This is an issue that required special sensitivity and attention during data collection and analysis.

4.5.1 Identifying Power during fieldwork

The intersections of power can be in the form of researcher-participant, reflecting in how stories, and interpretations are created from data gathered. The researcher can influence the data in a way that is not consistent with reality. Dealing with a research topic on the power relations among stakeholder groups in the management of Ankobra is a highly sensitive matter which subject to societal and political scrutiny. As I interviewed experts and political authorities in the government, questions posed were direct based on literature reviewed. I identified an asymmetrical and potentially exploitative power relation during the fieldwork. Dowling describes asymmetrical relationship as characterized by differences in social positions of the researcher and those being researched (Dowling, 2016). This was reflected in the study as I had to speak with government representatives with political power at the national and regional levels. They were in a position of

influence because of their relative access to political, environmental and legal resources. However, a potentially exploitative relationship is where the researcher is in a greater power position than the participants. Most of the local participants I interviewed considered themselves to be of lesser social and financial status, having information that I had traveled from Norway to the small community for data.

As with most qualitative research, the concept of subjectivity and intersubjectivity is crucial in the research process. Subjectivity is the insertion of personal opinions and characteristics in the research practice, while intersubjectivity refers to the meanings and interpretations of the world created, confirmed, or disconfirmed because of interactions (language and action) with other people with specific social contexts (Dowling, 2016). The socio-cultural settings determine how the researcher is perceived and how the participants are also perceived. Since I was introduced as a student from Norway, the impression was that I was an “outsider.” Perceived by the local people as different in class and status, I had to “play it right” to be seen as part of society. Since I could not speak their dialect, and my fluency in the “Akan” language is limited, I needed to defy the assumptions that I was a “foreigner.” To establish rapport, I used my old clothes and started mingling with the youth, who were more open to conversations without particularly taking note of limitations in language. This helped me a lot as they took me around the village, even to the galamsey site, which was not allowed. I was gradually considered an “insider.” This was very important because the participants, especially the women, were careful in their speech at times as one said, “I don’t know if you are a spy or undercover agent to gather information about galamsey in the community.” To deal with all these aspects of potential biases, power relations, and position in the communities, I adopted the critical reflexive approach.

There were a number of ways in which I practiced a critically reflexive approach in this project, adjusting and adapting as the project developed over time. As discussed in the above sections, power relations and subjectivity in qualitative research cannot be erased entirely. Still, their effect on the data can be minimized by constantly reflecting on the process from the beginning of research through to publication. This research is a contribution to a larger project, BC5 as well as sensitive to the public discourse on the impact of galamsey in Ghana. Specifically, I was told by most of the government representatives that they looked forward to the publication of the study because it is relevant to the development of the economy at large. Coordinators from the BC5 group also advised against victimizing stakeholder groups from the choice of words as it could

result in legal action. All these informed my approach to constantly share my experience with my project supervisor and keep records of everything that happened. The field notes became handy as a lot of the things captured informed my position in power and the influence on the discourse.

4.6 Limitations of study

As with every research, there were a few challenges encountered during this study. First was the limited time to get all the intended representatives of government institutions relevant in decision-making on the Ankobra river pollution. There was no feedback from the Ministry of Lands and Natural Resources which is the authority for dealing with the galamsey operations and its related impact in the country. Though I was able to access the two communities, it was challenging due to the poor road network. Some of my planned interviews were interrupted by rain, which made it difficult to access participants. For Eziome, the only means of access was by boat, which came with extra cost. Again, even though I was able to communicate with the people in my own dialect, it was sometimes challenging for the participants as they felt insecure speaking with me. During interactions, they would switch to their local dialect which I did not understand. Most of the government offices at the district and regional levels were far apart, making it difficult and time-consuming to reach them. For instance, I had to spend four (4) days traveling from the study communities to the Water Resource Commission representative, regional representative of the EPA, and the District Assembly representative to conduct interviews. Lastly, some of the participants were reluctant and fed up because they had participated in previous studies and never experienced any benefits. Instead, pollution and livelihood challenges continued in the communities.

Chapter Summary

This chapter focused on qualitative research methods in preparing, collecting, analyzing, and presenting data from participants. Using interviews, focus group discussion, and participant observation, rich data in connection with some pre-determined themes from literature and new themes and patterns from participants were derived. Participants included representatives from government institutions such as EPA, MMDA, and WRC. Additionally, traditional authorities, farmers, market women, fisherfolk, and NGO (Hen Mpoano) were involved in the interviews and discussions. These actors were purposively sampled using various kinds of sampling techniques

such as criterion, snowball, convenience. Ethical situations such as positionality and power relations during fieldwork were tackled using critical reflexivity. Conclusively, some limitations encountered during the research are discussed in the latter part of the chapter. The next chapter presents the findings derived from the interviews and focus group discussions and observations from the fieldwork.

CHAPTER FIVE

5. Results and Findings

5.1 Introduction

In this chapter, I present the combined findings and experiences from the interviews, focus group discussions, and field observations conducted with the participants in the two communities. I begin by exploring the participants' perspectives on the impact of galamsey and pollution on their livelihoods, based on the questions posed in the interview guide and during the discussions. Next, I delve into their opinions on the ban on galamsey and its effectiveness. Furthermore, the participants share their thoughts on the root causes of pollution and the key actors involved in galamsey. Finally, I present the participants' views on decision-making and collaborative management strategies for better pollution and galamsey control. Given the government's efforts to combat iASM in Ghana, which have not yet led to a decrease in the activity and its negative impacts on local communities and ecological resources, this section highlights the complexities and tensions that arise among stakeholders in dealing with galamsey at the local level. The nuanced perspectives and experiences of the participants provide valuable insights into these challenges and can inform more effective approaches to addressing the issue.

Between April 19th and May 8th, 2022, a total of 16 interviews were conducted. The interviews were categorized into different groups, namely government, district, NGOs, fisherfolk, traditional authorities, and local residents, as explained in the previous chapter. The participants included two (2) representatives from EPA, one (1) representative from WRC, one (1) representative from the District Assembly, one (1) representative from Hen Mpoano, three (3) local residents, three (3) members of the traditional council, four (4) participants from the fisherfolk, and one (1) former galamsey worker. The interviews are summarized in the table below, which includes a code for each participant.

Table 6. Overview of Interviews

Date	Subject Number	Gender	Subject Category	Community	Purpose of Interview
4/5/2022	D1	M	District Assembly	Represents both Communities	The purpose of the interview was to learn about the involvement of the local government in the decision-making process and management of the Ankobra
8/5/2022	F1	M	Commercial skipper/farmer	Eziome	The purpose of the interview was to learn about how the galamsey and pollution had directly affected their livelihood
3/5/2022	F2	M	Farmer	Adelekezo	The purpose of the interview was to learn about how the galamsey and pollution had directly affected farming in the community
19/04/2022	G1	M	Government	National	The purpose of the interview was to investigate the management strategies from the institution at the national level and concerns concerning decision making on galamsey and the pollution of the river
5/5/2022	G2	M	Government	Regional	The purpose of the interview was to investigate the monitoring and surveillance procedures at the regional level concerning the pollution
9/5/2022	G3	M	Government	Regional	The purpose of the interview was to learn the specific management strategies and challenges from the Ankobra Basin management

5/5/2022	N1	M	NGO	N/A	The purpose of the interview was to learn from a scientific point of view, the findings from SFP, challenges, and recommendations for sustainable management decisions
3/5/2022	R1	F	Local resident	Adelekezo	The purpose of the interview was to learn about how the galamsey and pollution had directly affected farming in the community
3/5/2022	R2	M	Fisherman	Adelekezo	The purpose of the interview was to learn about how the galamsey and pollution had directly affected fishing in the community
22/04/2022	R3	M	Galamseyer	Adelekezo	The purpose of the interview was to learn about how the galamsey in the community was done and the perceptions about the impact it has on tributaries and main Ankobra
21/04/2022	R4	F	Local resident	Adelekezo	The purpose of the interview was to learn about how the galamsey and pollution had directly affected their livelihood
8/5/2022	R5	F	Local resident	Eziome	The purpose of the interview was to learn about how the galamsey and pollution had directly affected their livelihood
6/5/2022	R6	M	Fisherman	Eziome	The purpose of the interview was to learn about how the galamsey and pollution had directly affected fishing in the community

22/04/2022	T1	M	Traditional leader	Adelekezo	The purpose of the interview was to investigate the concerns from traditional leaders' point of view and strategies they have put in place to manage the pollution. Also, on their involvement in decision making
8/5/2022	T2	M	Traditional leader	Eziome	The purpose of the interview was to investigate the concerns from traditional leaders' point of view and strategies they have put in place to manage the pollution. Also, on their involvement in decision making
26/04/2022	T3	F	SFP Committee	Represents both Communities	The purpose of the interview was to learn about the practices learnt from SFP and the challenges they have faced from galamsey and pollution

Three sessions of focus group discussion were conducted for this study. As with the interviews, participants were selected based on convenience and criteria. Specifically, the market women in Adelekezo were presented with the discussion when they had moved into the village for a funeral ceremony. Usually, they are not in the town until a gathering as such or sometimes on Fridays when they observe “sabbath” from work. I had a discussion with the women in Eziome who used to be fishmongers, but since the trade collapsed, had resorted to crop farming. They gave rich information on how the situation had affected their way of life, livelihood, and families. The Sustainable Fisheries Project (SFP) committee Chairperson, together with two others from the Adelekezo community, volunteered to take part in the discussion and share their views on the benefits of the project, the strategies adopted, and the challenges they were facing. The committee is made up of representatives from the five (5) estuarian communities; Adelekezo, Kukuavile, Sanwoma, Eziome, and Ajomoro Eshiem, but unfortunately could not gather all representatives except those in Adelekezo and the former Chairperson of the SFP from Eziome community. I was only able to meet the group of women who used to be fishmongers from the two communities and SFP committee members due to their availability and logistical constraints. The table below gives a summary of the discussion of which participants are represented by code FDG in the findings.

Table 7. Overview of Focus Group Discussion

Date	Subject No	Group	No. of Participants	Purpose of Discussion
21/4/2022	FGD 1	Market women	5	The purpose of the discussion was to learn about how the galamsey and pollution had directly affected their livelihood
8/5/2022	FGD 2	Market women	3	The purpose of the discussion was to learn about how the galamsey and pollution had directly affected their livelihood
26/4/2022	FGD 3	SFP Committee	3	The purpose of the discussion was to know the views on the benefits of the project, the strategies adopted, and the challenges they were facing because of the pollution from galamsey operations

5.2 Observation

To gain deeper understanding of the meanings of place and contexts in everyday life, participant observation was employed in addition to interviews and focus group discussions. In contrast, participant observation seeks to develop an understanding through participatory experience in everyday interaction. I lived 2 weeks in a community (Dadwen) near the two towns, which was where I could find accommodation. I wanted to experience how people moved in and from the communities and by what means. My first visit, after I had received letters from the University of Ghana to the Chiefs of the communities, was to meet the traditional council of each community and brief them on the objectives of the study and its benefit to the community. My observations started right from this trip from the capital (Accra) to the communities. Using a passenger vehicle, I spent 9hrs on the road to Tarkwa (nearest town) and rested the night. Early morning the next day, I set off with a friend to lead me to the communities which took us an extra 4hrs on road. Because it was the first time visiting, I needed someone to serve as a gatekeeper to take me to traditional leaders.

As remarked by (Hay, 2016, p. 323), gaining entry to social setting is potentially a “fundamental challenge” which makes it necessary to identify key individuals who will serve as gatekeepers to facilitate the opportunities of interactions with others in the study area. My first point of contact was a friend who works in the region but unfortunately, he did not know the communities I was going to research but offered help in getting a colleague at work who is a native of the region to lead us. This proved to be beneficial as he knew the “Assemblyman” (represents the local government in the electoral area) personally. We met the Assemblyman and the teacher at Dadwen and took a motorbike from there to Adelekezo. This was the only means of transport to the community during rainy seasons. From this point, I built relationships with the motorbike drivers and became popular among them because I would thereafter take the bike to the community twice every day. After reaching the community, the Assemblyman led us to one of the elders who welcomed us, and we introduced ourselves and presented the reason for the visit. The traditional leader then called for a meeting with the Chief at the traditional palace to welcome us. This made the people in the community feel at ease because the Chief accepted the project and promised to inform the community to help me with anything I needed for my data collection.



Figure 4. Introduction of fieldwork to Traditional leaders of Adelekezo community (Author is second from the left).

5.2.1 Observations from Adelekezo

Surrounded by wetlands and drained by Hammar River (a major tributary that flows into Ankobra), it is rich in mangroves. There were few people present in the community, especially the youth, which I was told was due to lack of sustainable source of livelihood. I would go to the community center early in the morning about 9am to observe the way they prepare for morning chores, chat with passers-by, and wait with the market women who only sold local snacks. I observed that most of the people would go to farm and return about 4pm but most of the women were home the entire time. Despite a strong traditional leadership compared to other communities, governance on natural resources in Adelekezo is weak. Currently, the SFP Committee acts as the CBM authority with the help of Hen Mpoano to manage the mangroves and utilization of the natural resources in the community. The District Assembly's involvement in the community is also not forthcoming.

There is only one road that connects from the main road in Dadwen through Avrebo to Adelekezo. This road is untarred and cuts through thick forests and usually floods when it rains. This was not a challenge only for the research but for the people who live there. A typical example is during a Friday community funeral ceremony where it rained the day before and at dawn, all motorbike drivers did not show up at the station and left those that wanted to go for the ceremony disappointed. On one occasion, I was supposed to meet a participant for an interview but was interrupted by rain along the way. However, the road is under construction under the department of feeder roads of the Ministry of roads and Transportation. It is a 54km road that connects Dadwen-Avrebo-Ahunyane-Adelekezo.



Figure 5. Road network from Dadwen to Adelekezo community

For a community surrounded by wetlands and rivers, access to drinking water should not be a problem, but that is not the story in Adelekezo. The pollution of the river has made it difficult to treat, or drink, which has forced residents to buy sachet water. Sachet water (treated water sealed in plastic) is expensive, and few can afford it hence they drink the polluted water using strategies

such as boiling and local means of filtering. A borehole was constructed for the community, but I was told it has been faulty for over a year, and it is not the first time a borehole was dug and could not last even a year. Also, the residents dispose of waste generally in their backyard since there is no waste disposal site.



Figure 6. Abandoned borehole and water the community fetch from the river to drink

As I spent most of the time in the community walking about to find out how the residents spent their day, it was observed that most of the homes were empty, usually from Monday to Thursday. Since there is no active trading of food crops and fish, most of the residents have moved to the bigger town nearby in search of greener pastures. There is a galamsey site I visited in the village, which was abandoned due to lack of resources and a decline in gold samples. This may have accounted for the absence of youth in the community. Most of them return home on Fridays, which is traditionally a rest day from work so families and the community can interact and perform social functions such as funerals, weddings, etc.

Most of the people in the community are uneducated even though there is a public facility built recently to support education. The school (ADK M/A Basic School) runs from Nursery to Middle school. Most of the pupils are not able to complete or discontinue schooling after basic education due to lack of finance as most of the parents explained during our discussions. The

community, however, has access to electricity, but it is very unstable and disconnected from the main source when it rains.



Figure 7. Public school building in Adelekezo

5.2.2 Observations from Eziome

Eziome is a small community on a hill sharing borders with Adelekezo on the opposite sides of the Ankobra river. When I visited the community, there were only a few residing there, including the acting traditional leader. Most of the residents were said to have migrated from the community following a dispute between the community and Bokro (community nearby). Unlike Adelekezo, Eziome has no motorable roads. The acting traditional leader serves as the local authority in the community. The leadership is very weak and has no laid down management strategies for sustainable use of the natural resources in the community except the recommendations from the SFP committee. Means of transportation is by boat through Sanwoma

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from the south or nearby communities. There is a footpath from to Adelekezo through swamps and wetlands which was not recommended. I traveled by boat with a commercial skipper who happens to be a native and shared with me some interesting stories about the community⁸.

Similar to Adelekezo, the community has had their main source of drinking water, which is the Ankobra river, polluted and made unsafe for use. In order to get an alternative source of drinking water, the residents either have to transport sachet water by boat or trek over 3hrs to neighboring communities. They do have an open borehole which they fetch water from for domestic use, but it is not hygienic, and residents adopt strategies such as boiling the water before use. There is no toilet or waste disposal facility in the community.



Figure 8. Open borehole in Eziome

⁸ See pictures of the trip to Eziome and the current state of Ankobra river in the appendices

The community as they described has become a “ghost town.” There is no active trading of fish or food crops in the community, but the residents engage in cocoa farming. One major issue I observed was noise from the forest. I was told the youth were engaged in logging which has accounted for deforestation and the local extinction of various kinds of species. Most of the youth live deep in the forest and work with undisclosed people who buy the wood. This is seen as a lucrative venture since there is no alternative source of livelihood. There is no school or health facility in the community, and residents must trek miles away to neighboring communities for these services.

Having presented the social, political, economic, and cultural settings of the study areas, which gives context to the views of the local people and the social structures that shape their perceptions and position in the management of the river, I proceed in the following sections to present the main themes that set the foundation for discussion.

5.3 Impact of galamsey on livelihood

This section reports on the participants’ perceptions of the effect of galamsey pollution on their livelihoods. For communities heavily dependent on the river and its services, this was a highly relevant topic, and they shared their experiences and grievances. Participants were asked directly about the various ways river pollution has impacted their livelihoods, with the main themes being drinking water, food and agriculture, and daily economic activities. Most of them noted that galamsey had a negative impact on their livelihood, though some argued that it was also a source of livelihood as there are limited alternative high-income opportunities.

5.3.1 Impact on Food and Agriculture

A large portion of these communities’ population are farmers and fishers, which means the river is the main source of livelihood. Participants expressed their grievance on the extent the galamsey activity had destroyed their crops, others pointed how trees along the river that protected their crops were cut down, the lack of fish, and extinction of some local species that served as food for them. They spoke during the interviews about how farming and fishing were no longer lucrative sources of livelihood for them because the galamsey had destroyed everything. Also, the reduction in fish stock affected their food pattern, since fish was a main part of their diet and an important

source of protein. The lack of fish has further affected social events such as funerals and festival because they had to sometimes buy fish from the city or meat to prepare food for such occasions. A fisherman during an interview narrated how the galamsey had changed the routines in fishing and food system in the community. He explained:

“In the olden days, the water was black (referring to how clean it was) and when we bring fish home it was enough for the whole family such that we could not even store all of them. We had to smoke some and store it in the barrel. But you see since the galamsey started, there is dirt in the river - we do not even get fish for food” (Participant R2)

During a discussion with a group of market women who were preparing food for a funeral in the community, it was revealed how the pollution of the river had made it costly to prepare food for such occasions as compared to years before when the river was clean, and they could get enough fish to prepare food.

“We used to get fish from the river but now it is not the case. We do not even have fish for food. There is a funeral here today, some years ago, we would have had baskets full of fish for the occasion but here we are, we had to buy chevon and fish from the market in the city for the funeral. Look at this (showing me the meat they bought from the market at a high cost), we are really suffering.” (FDG 1)

Even though the market women did not really have knowledge on the cause of the river pollution, they agreed that galamsey might have played a role in it. The fishers, youth and farmers who work close to the river, and have their fishing destroyed due to the pollution, could confidently say it was the illegal mining operation in the river that led to the pollution of the river and its associated problems.

During the interview, the participants claimed that the pollution of the river not only affected the fish stock and food but also made farming difficult in the village. They revealed that the chemicals used in washing the ore in the river destroyed the crops when using water for irrigation purposes. This has made treatment of crops again costly compared to previous years before the river’s pollution. A traditional leader who is also a farmer in our discussion stated;

“At first, when we grow maize, it would grow so beautifully. Now, it grows like there is a disease with it. Almost all our crops are not able to grow well because it is the

same river we use for irrigation. All our cocoa farms are not yielding much because the water kills the crops, and it brings pests and diseases than we used to have it. It was not like this before the river became polluted.” (Participant T3)



Figure 9. Cocoa farm along the Ankobra in Adelekezo

Figure 9 shows a cocoa farm near the river that belongs to a farmer who explained to me how the polluted water affected crop farming when used for irrigational purposes. Parts of the farm were infected by diseases, and the farmer pointed to the affected soil quality from the chemicals disposed into the river. During an interview with a fisher who also owns a cocoa farm in Eziome community, he expressed his dissatisfaction with how the pollution had affected the way of cultivation of cocoa crops and pleaded that the galamsey operations should be ceased.

“As a fisherman, stopping this (galamsey) would help revitalize my livelihood.

Some time ago, I fetched water from the river Ankobra to water the cocoa crops, and they

almost died. The water is now poisonous. I do not have an option but to use it anyway. Stopping the galamsey is our only lifeline to survive.” (Participant F1)

A former fishmonger also explained how she had switched to farming after the fishing business halted due to the pollution of the river but expressed that farming was not profitable either.

“Now the fishing market in this community is not moving because there are no fish in the river. I have a cassava farm I work on now to get income to cater for my children and family but that is not even profitable because after harvesting, we cannot transport them to other communities to sell. The road is bad, and it is more expensive to transport the cassava to Axim (nearby city) than the income we will get from selling it. We are really suffering. There is nothing to do here so please help us. I am not able to support my children in school after completing basic education because I do not have funds. One of my daughters completed Junior High School this year, but she is home. I do not have money to support her secondary and tertiary education” (FGD 2).

5.3.2 Drinking water

In Ghana, most communities depend on rivers and streams as sources of drinking water and for domestic purposes, especially in the rural communities close to rivers. The interviews showed how important the river is to the people of Adelekezo and Eziome as they expressed their opinions on how pollution has affected their way of life in general. Most participants explained how drinking water has become a major communal issue since the river is turbid and it is costly to depend on treated drinking water. It costs 6.00 Ghana cedis (8kr) to buy 15 liters of water which is quite expensive considering how much water is needed for the household and their income levels.

Speaking to a traditional leader on the matter, he expressed his disappointment at how they had allowed the pollution to affect the community to the point that they have no clean drinking water. He stressed;

“If care is not taken because of the greed and selfishness of some individuals, we may have to import some water. We cannot even drink the water again. We really need the chiefs to step up.” (Participant T2)

It looks likely that the rural communities along the Ankobra river will eventually import water from elsewhere for domestic purposes if there is no intervention on the galamsey activity in the river. This will only worsen the state of the local people since they cannot afford the sachet water.

A woman who has 10 children during a focus group discussion expressed her grievance about the polluted water and fears this might have an impact on her health since it is the only source of drinking water.

“Since I was born, this river has been the source of drinking water for me. Now we do not have good drinking water. Even now, I drink it because I do not have money to buy treated water. God knows what will happen to me in the future because we are all sick. I can show you the water we drink if you think I am lying to you. (She sends for a cup of water fetched from the river to drink as proof)” (FGD 1)

Some of the participants expressed the same opinions on the water and sanitation problems in the community. Any attempts to provide a clean source of drinking water in the communities have not gone as expected due to reasons they could not tell.

“My main worry is our drinking water. The government must help us with drinking water because it is costly to buy treated water. And we do not even have the money to buy it anyway, leaving us with no option but to drink from the polluted river. They provided us with a borehole, but they do not drill well so after a few months it stops flowing. I sometimes ask myself if we are part of Ghana” (FGD 2)

A fisherman also added during the interview;

“Right now, the Ankobra is poisonous. Even though we drink it, but it is not good. The chemicals they use during the galamsey have poisoned the river. You may not feel the effects immediately, but soon enough you will feel it. We cannot even use it to wash our clothes” (Participant F1)

Similarly, a participant during group discussion from Eziome added she needed to use her own method of purifying the water from the river before using it as drinking water. Stating that the pollution which had gone on for about 10 years has really interrupted the way domestic activities are done.

“The pollution started over 10 years ago. Ankobra was the source of drinking water for us. If you fetch a day before and store it for the next day, it becomes cold as you get it from the refrigerator. We used it to bathe, cook with it and use it for every domestic purpose. We dug a well but that it is also not hygienic so any time I have to drink, I boil it a day ahead to take out the germs.” (FGD3)

The responses from the interviewees point to the fact that drinking water and water for domestic purposes, in general, is something they feel they have been deprived of as a result of the galamsey operations. The fear is that if this continues, they can lose everything they have, including the locals’ health to several waterborne diseases and complicated conditions due to the discharge of chemicals in the river they drink from.

5.3.3 Economic activities

Just as the pollution of the river has affected the drinking water, food, and agricultural activities in the communities, it was evident in the interview that it also had a negative impact on economic activities. In this context, economic activities refer to buying and selling of farm crops, and fish and the overall distribution of cash in the communities because they are typically small coastal communities that depend on rivers and farm crops. Most of the participants during the interview and focus group discussions told me how they had lost their jobs and life had become so hard for them and their families.

A market woman who previously worked as a fishmonger explained to me how she lost her job due to the decrease in fish stock.

“There is no fishing business in this community again. All the market women are now farmers because there is no fish. How can we get fish from this polluted water? We are now into cocoa farming and the youth are also engaged in deforestation as you can hear in the forest because they cannot go fishing. I started trading fish when I was a child because that was what our predecessors did, but this generation does not have that because of our selfish gains that have accounted for the pollution of the river.” (FGD 2)

Another participant, when asked if the pollution had affected economic activities in the community (Adelekezo), revealed how most of the unemployed youth had lost their jobs because of pollution and a significant decrease in fish stock.

“Yes, it has negatively impacted the community’s economic activities. This is because the chemicals used for mining have made the water unclean, even for agricultural purposes. The river served as a resource for fishing, which is the main activity in this community. The guys you see who do not have jobs to do now were once fishers. They were fishing to make a living, but all the fish are dead. They cannot survive in this polluted river. It has really caused economic hardship, and we are not happy with it, my brother. Something must be done to stop this galamsey. We must prosecute the perpetrators.”
(Participant R5)

As you hear in the quote above, the collapse of the fishing business in the Eziome community has not only interrupted the fishing trade, but it has also led to the youth engaging in other activities to earn a living, many of which further destroy the landscape and other natural resources in the community. During an interview with a traditional leader in the Eziome community, he expressed his concerns about how the youth were cutting down the trees for wood as an alternative source of livelihood after the collapse of the fishing business. When asked where the noise was coming from in the forest at the time of interview, he explained;

“They are cutting down trees. That is what the youth in the community mainly do. But being that, the trees are even finished. We were suggesting to them to get better jobs. Right now, the youth do not want to engage in farming because it is not lucrative. In the olden days, they would cultivate large acres of cocoa, but now they do not want to. Or better still, they can learn a trade.” (Participant T2)

The narrative from most of the participants was that the galamsey activities had destroyed their main economic activity, which is fishing trading. This is supported by the decrease in fish stock and the local extinction of the specific species valuable in the market. Even though they recognized on the opportunities galamsey brings to the community, especially in small communities where there are lack of jobs and economic activities other than farming and fishing,

but the destructive nature of the operation makes it difficult to be accepted in the community even though it creates more income as compared to farming and fishing.

With increasing degradation and pollution of the land and resources in the community posing a major threat to their livelihood, most participants are pessimistic about the future of the communities and reflect on the need to put an end to the ongoing galamsey operations.

5.4 Perceptions on the ban of galamsey

Participants were asked to express their opinions on the ban on galamsey. This section presents the results of their opinions on whether they agreed or not with the government's decision and how this impacted the pollution of the river. Of the sixteen (16) interviews and 3 FGDs conducted, most people agreed that the government's decision to ban galamsey was the right initiative. These were some of the comments by the participants suggesting the government's decision was beneficial.

Participant R5

"Yes, I agree with the government's decision to ban illegal mining. The previous ban on illegal mining activities reduced pollution to a minimum. The water reverted to its original state..."

Participant F1

"During the government's active action against illegal mining, we noticed a drastic change, it reduced the pollution of water bodies in the community even the color of the river was restored. For about 6 months the river looked beautiful but soon after they [galamsey miners] returned"

Participant F2:

"The ban in 2017 on galamsey helped reduce the murkiness of the river. Even in the last few years that we have done works by NGOs to educate the people on the impact of pollution on the river, it has caused a reduction in the pollution. It is getting clean"

Participant R2:

"For me, I think we should go back to the ban. Government should discharge the military on patrol to enforce the ban. I think that will really help us because the previous one helped to restore the river. They must resume the action of stopping all illegal mining activities."

Participant R6:

"As for the ban on galamsey by the government, it actually was helping, during that military patrol, they were still mining. The galamseyers returned immediately after the soldiers left. Recently, some new people have joined the guys mining upstream, making it much worse. (Pointing finger to show where the new people are)"

These responses from the local residents and fisherfolk suggested that the ban on small-scale mining by the government at the time contributed to restoring the river. The worrying aspect is that while the ban was in force, some perpetrators were still mining in the river and they shared their frustration on how the destruction has even increased since the lifting of the ban. Some suggested that the government should order the military to patrol the various stations on the river again. Others also claimed that there were some whistle blowers among the military that informed the galamsey workers of their patrols before they came to the sites which allowed them to vacate and return immediately after the inspection. This hinted at some informal deals between the galamsey workers and the key players in managing the situation. A participant alleged during the interview that there are unlawful negotiations involved in the galamsey operation.

“The galamsey really destroys the river. The lands for the mining are released by the chiefs to the people. Even after some have been arrested, they bribe the security personnel and are released. Some political figures who claim they are not aware are themselves sometimes directly involved” (Participant D1)

Perhaps this is the reason the interventions have not been entirely successful, because there are several actors who have interest and stakes in the galamsey operation. This is a popular belief among the fishers and residents because the traditional rulers and district authorities have not been proactive in dealing with the issue and even have insider information from some of the galamsey workers that some chiefs upstream own boats involved in the operation.

“This time much more destructive than before and the authorities certainly are aware. Some even have stakes in some of the ventures. Some chiefs even have boats they use for galamsey.” Participant F1 shared.

5.5 Causes of pollution

This section presents the results on the opinions of the participants on the main causes of the pollution of the river. When asked what the main cause of the high turbidity of the river was, there was widespread agreement that the illegal mining operation was the cause. Even though some agreed that there were other causes, they pointed out why those practices were not enough to create

pollution compared to the prolonged and unresolved galamsey operation on the river. Since the two estuarian communities are downstream of the river, they informed me that they are recipients (victims) of the pollution, not the perpetrators. Stating that the main perpetrators are the communities upstream.

“The indigens (referring to the estuarian communities) do not necessarily pollute the river. Those who stay around the river do not engage in the act. The pollution is caused by galamsey activities upstream.” (Participant D1)

During an interview with a participant who previously worked as a galamaseyer, he shared that the Ankobra river pollution was due to galamsey operations upstream of the river, which supports the claims from participant D1 when he was asked about the main cause of the pollution. He further shared that illegal alluvial mining was not done in the Adelekezo and Eziome communities.

“The illegal mining causing this pollution is taking place upstream but not in these communities (Adelekezo and Eziome). Also, people with machines from different sites come to work there, “if you are granted permission by the chief to carry on with your work, then you’re given a portion of the land to operate on” (Participant R3)

A fisherman also made the following remarks

“My brother (referring to interviewer), the galamsey in itself is being undertaken at the top of the river. Communities around Dominase, Abura and a few others in the forests (mentioning some of the communities upstream where the galamsey in the river takes place) The people use the Chinese machines for the galamsey. It makes the river downstream on our side extremely polluted” (Participant R6)

Even though the narrative was that the main pollution was from upstream communities, there were traces of illegal practices of mining on land (in the forest) that contributed to the pollution of tributaries in the study area that flow into the main estuary. I observed a surface flow of waste discharge from the forest on our way to an abandoned galamsey site.



Figure 10. Discharge from an abandoned galamsey site in Adelekezo

This turbid water flows through the forest directly to the main tributary of the Adelekezo community and further into the Ankobra river. The local people however were unaware of how this could contribute to the pollution of the river since the actual mining was not done in the river like in the upstream communities. They disagreed with the fact that it had any contribution to the main cause of pollution of the Ankobra river. Most of the participants stressed during the interviews that the communities had nothing to do with the pollution of the Ankobra but only victims of the activities upstream. However, an expert in the district when interviewed, had a different opinion about the community's contribution to the pollution. During our discussion he stated;

“Some of the tributaries of the Ankobra river have been polluted, which contributes to the destruction of the river. The EPA only knows of the destruction of the main Ankobra

river but most of the tributaries in the small communities have also been polluted by illegal mining that flows into the Ankobra” (Participant D1)



Figure 11. Discharge from an abandoned galamsey site in Adelekezo

This is further supported by the explanation of how the galamsey operation was done. Drawing from his previous experience as a galamseyer, Participant R3 also shared that there was waste disposal into some of the tributaries after washing the sand for gold which eventually joins the main Ankobra. He shared:

“To obtain the gold, we have a machine that holds the load and then filters the gold into a container below the machine. After the separation, the sand is disposed of with the water and as a result of this some end up flowing into the tributaries.”

5.6 Galamsey operations

This section presents the findings of the main actors involved in the galamsey and pollution of the estuary in the communities and the relationship among them. There is a sufficient amount of data and documents on the influence of foreign investors (international and national) in the operation of galamsey in most rural communities in Ghana. Participants were asked about the nature of the operations, the actors involved, whether the main actors were locals or foreigners, and how they contributed to the pollution of the river.

Only a few participants attributed the pollution to Chinese immigrants, while the majority claimed it was a combination of the Chinese and some local authorities and immigrants who migrated from other coastal regions of Ghana. A participant explained during the interview that there were some local immigrants (Ghanaians from other parts of the country) and a few Chinese residing along the river who were involved in the mining.

“The destruction however is mainly from foreigners not the indigenes. They are the people rich enough to acquire the surrounding lands and able to purchase the machines. Most of these people are Ghanaians but not indigenes. A few of them, however, are Chinese. But the Chinese pass-through Ghanaians to secure the lands.” (Participant D1)

Another participant had this to say when he was asked who the main actors involved in the galamsey activity in the river were.

“Usually, local migrants from other parts of the country. Very few indigenes even believe the gold is in the river. They put the machine in the boat and connect a tube to the riverbed. The machine collects the soil and washes it. Then puts the waste back into the river” – (Participant F1)

There were divided opinions from the participants on the machines that were being used to mine whether it was imported into the communities by the Chinese or invented by foreigners from the east coast of Ghana and if these machines were the cause of the pollution of the river.

One participant claimed that there were no Chinese immigrants on-site in the communities who are engaged in galamsey, but Chinese machines were used by the local immigrants from the east coasts of Ghana.

“Ow yes. In our part of town, the Chinese are gone. But they have a store where they sell the machines that the galamasey workers use to destroy the river. The machine works by digging up the riverbed and passing the soil and rocks through the machine and the waste back into the water. Those mining the alluvial gold use excavators in addition to the Chinese machine. The Chinese have about 2 or 3 stores around, which are quite close. The Ewes (local migrants from the East coast of Ghana) get the machines they are using from the Chinese.” (Participant T2)

Another key participant, talking from a national point of view also attributed the gravity of pollution and degradation to the introduction of Chinese machinery.

“...The second thing is that the arrival of the Chinese brought in technology. If you talk about small-scale mining in the past, maybe 20 years ago, even 15 years, it was about shovels and pickaxe, yes, those things, so the level of degradation was minimal. It would take about 20 years before somebody could even degrade an area, so they gather and then they sell. They brought in the technology that can, you know, the introduction of equipment Chang fang machines, heavy duty bulldozers, graders, and excavators especially, so you have a 25-acre area, something that should last you 2-5years, could take you just 2 months. Most of them were doing it illegally, conniving with the locals.” (Participant G1)

Talking to a representative from the WRC on the kind of machinery used in the galamsey activity and how it contributes to the pollution in the communities, he emphasized that the Chang fang machines did not contribute as much as the method used by the Ewes.

“The Chang fang machine itself does not cause much destruction as you see there. It is actually different equipment that they use together with the Chang fang which is by the locals and has a long tube connected to the pumps that stir the bed of the river. The Chang fang mainly cause destruction on land.” (Participant G3)



Figure 12. Illegal mining activity in the Ankobra river (Undisclosed, 2022)

Figure 4 shows a gamamsey mining activity going on upstream of the Ankobra by local people. As seen in the picture, they use pump and tube that stirs the bed of the river and creates a muddy discharge.

“The Ewes have a way of mining on the river that is responsible for most pollution. They put their machine on the boat or floated barrels and connect a pipe to the riverbed which excavates the soil and makes the water very murky. The Chang fang does not destroy the river much” (Participant D1)

Most participants also alleged that there is a collaboration between the local authorities and the Chinese investors which gives them the license to operate, manufacture, and import Chang fang machines into the community. Even though there are no Chinese immigrants seen mining in the river currently, the gamamsey workers still use imported machines from China.

“We tried to stop those doing alluvial mining in the river but to no avail so if you have come to help us, we will help you but most of the work depends on the government because the machines that are imported from China to the country, I have no idea how it is manufactured or gets here unless it is here in the community. So, the government must take responsibility to ban the importation of these machines. If it is not for the profit of the ministers and politicians, they would have banned these machines from being imported into the country and even Chinese immigrants” (Participant T1)

Regarded as the main reason for the continuous pollution and galamsey activity in the Ankobra river, the major theme that was stressed by most of the participants when they were asked who the real actors were was the alleged corrupt negotiations of people in power, both traditional rulers and political leaders. Corruption among government officials and traditional leaders in natural resource regions in the country has gained popularity since the rise of the galamsey. For people along the Ankobra river who have been impacted severely by the pollution of the river, any major decision taken by the central government or traditional leaders without tackling corruption is merely political talk. Participant T2 during the interview allegedly described that some of the instances of corrupt acts between government authorities and the galamsey operators.

“Some of the galamseyers produce documents from the government that gives them the permit to mine. Whether it is fake or legit, we do not know. When they submit the documents, the chiefs cannot say anything. Their reach is not that much in the government.”

According to Participant F1, it would have been easy to stop galamsey and the pollution of the river if government officials in the district were faithful to the constitution and executed their responsibilities. To him, this has not happened because some officials are derailed by bribes they receive from those involved in the galamsey when they were voted into power. He shared;

“Unfortunately, when people are elected to power, they are derailed when bribed by those engaging in the acts. Gold produces a lot of money, so it is easy to bribe executives, which they do.”

These allegations were supported by some of the residents and fisherfolk in the communities who suggested that the security personnel who are tasked to patrol the river and cease machinery used by the galamsey operators connive with them and allow the operation to continue. He described the situation as ‘unfortunate’ and that drastic measures should be taken against leaders in those communities. He shared;

“The laws when announced on TV sound so nice but the implementation. It is unfortunate that the soldiers sent to enforce the law quickly abandon post when some of the money from their illegal acts are given to them. I think the chiefs should be prosecuted seriously when their area is found to be involved.”

Like F1, Participant T2 during the interview also insisted that the military intervention against the galamsey operation was helpful but alleged that some were engaged in corrupt acts.

“The government has to deploy the military to stop the galamsey operation [from operating in the river]. But even the soldiers are corrupt. When the “galamseyers” are arrested, they give the soldiers some of the gold and the soldiers let them go”

For these interviewees, it is not just enough for the government to discharge military officers to intervene but must also see to the effective implementation and conduct by these officials as it has not been expected according to them.

Despite the agreement of the participants that foreigners were involved in the galamsey activities in the area, most participants from the communities alleged that some political and traditional leaders were the main actors behind the scenes, collaborating with foreigners and investors in the galamsey operation in the river.

5.7 Management of river pollution

This section presents the perceptions of the participants regarding the management practices undertaken to curb the pollution of the river. As shown in Table 5, all actor groups including government officials at the national level were interviewed on this matter. Various

representatives of agencies expressed their opinions based on facts and experience while working with the agencies and at what level they represent. A representative of the main NGO (Hen Mpoano) involved in the management of the Ankobra basin was also interviewed to reveal some of the issues they have encountered during their active research and involvement in the communities. The responses revealed a complex and inconsistent flow of information among groups that have the legal mandate to regulate and monitor the basin and the complex conflicting roles among river users.

5.7.1 Roles of actor groups in the management of the estuary

This section covers the responses of participants on the roles they play in managing the estuary in the study areas. The decentralized system of governance provides the basis for different agencies with different roles in regulating and managing natural resources in Ghana. The interviews revealed that most of the agencies, though they have the legal authority to implement their plans and regulations, are impeded by conflicting interests and responsibilities of other actor groups. Some stakeholder groups felt it was the responsibility of other actor groups to ensure that the galamsey, the main source of the river pollution, was stopped.

According to a participant from the EPA, the Water Resource Commission is the main authority responsible for the management of the river. However, he agreed that the EPA also had a role to play in management to some degree by the law as well as some government agencies depending on the situation.

“That would be water resources commission. Within the frame of the law, they are responsible for managing all our water resources. But there are also other resources in the river. There are other minerals, and, in this case, there is the need for the minerals commission to work hand in hand with the water resource commission to manage the river. The law also provides space for the EPA to also play a role in the management of the resources” (Participant G2)

A local government representative had a different view of whose responsibility it was to manage the river, especially in its current polluted state due to galamsey activities. As an institution that represents the government at the local level, he believes it is no other’s responsibility than the

local government under the leadership of the District Chief Executive, who, by law represents the President and has the authority and backing of the executive arm to combine forces with the judiciary and other institutions at the district level for the district's development.

“It is the job of the police commander and district chief executives. I think the government should dethrone some of the chiefs who released the lands and sack some police commissioners and district executives from office. All these people are very much aware of what is going on but are passive when it comes to the implementation of the laws”
(Participant D1)

During an undisclosed interview with a representative from the Water Resource Commission, he described the situation as ‘difficult’ even though from the point of law they have the legal authority to implement regulations and even persecute perpetrators who exploit the river for their personal gains.

“The Ankobra basin and Pra Basin management board is responsible for monitoring and ensuring that the rivers are used in a sustainable way and preserved for future generations. Our work, however becomes difficult if we do not get the support, we need from the other institutions that are mandated to perform some duties. The community and the traditional authority must cooperate in particular because we can do whatever we can and will not yield any results if they don't cooperate. Listen to me, If the community says no galamsey, there is no galamsey” (Participant G3)

Another government representative shared during the interview that even though it was the government's responsibility as mandated by law to effectively manage the river and its resources, the galamsey issue in particular is dependent on the willingness and contribution of the local communities to manage the resource.

In tandem with this assertion, almost all the local interest groups that were interviewed i.e., fisherfolk, local miners, and local residents and traditional leaders suggested believed they had a role to play in management but stressed that the government (broadly without specific institutions) was responsible for managing the river. These were some of the responses when asked about whose responsibility it is to manage the river.

Participant R5:

We all have a role to play, but ideally, it is the responsibility of the government, community elders, and other authorities.

Participant R2:

I believe it is the responsibility of the government that the water bodies are kept clean. We are still pleading with the government to resolve the issue. They should set up a board of authorities that will monitor illegal mining activities.

Participant R4:

I believe we all are responsible in preventing water pollution, but we cannot do this without the help of the government, therefore we are pleading on government, if possible, to re-take this action [banning of small-scale mining activities] in order to reduce the pollution of the river if not totally prevent it.

Participant R3:

Yes, the galamsey issue and effective management of the river can be achieved but we need the help of the government to resolve this.

Participant R1:

Again, if the government could help employ a task force to help scout and bring out those who pollute the environment, I believe this will help reduce the rate of pollution. Hence, it is both the responsibility of the public and the government to resolve the issue of pollution R1

While R1, R4, and R5 were of the view that everyone (local people, fisherfolk, government institutions, NGOs) were responsible for the management of the river, R2 and R3 stressed that it was the duty of the government to maintain an effective management system to resolve the pollution and galamsey operation in the communities. R1 added that the government should deploy a task force that will patrol the river and environs to fish out perpetrators who are actively polluting the river by illegal means of mining. This could contribute to pollution reduction.

Participant T3 specifically stated that the local people from the community were supposed to act as *watchdogs*. Having participated in the Sustainable Fisheries Project, he also noted that it was important for the traditional authorities in the communities to be involved actively to ensure foreigners especially do not come into the community for galamsey purposes. He suggested public

education on the importance and need for the local residents to protect their resources as the possible solution to the issue.

“It is the responsibility of everyone and not only the government. Because the government sits in the capital (Accra) but there should be education for all of us to come together to help. The chiefs are also to take responsibility. I cannot go to the community as a stranger to work without meeting the chief. The community must be the watchdogs.”

Citing successes from previous sensitization programs, Participant G3 also remarked during our discussion that the community was the “first point of call” to tackling galamsey and its related pollution. *Empowering* the community through education and sensitization to him was a proven way of getting the backing of the community to support government’s interventions on managing the situation. While John did not emphasize on the role of government institutions in the public education on the galamsey, a government representative also suggested that the government institutions responsible for the management of the estuary and related resources are the channels through which this can be done.

“Some years ago, I was part of a program that sought to engage the locals in some areas in Tarkwa on waste management. We moved from house to house, broadcasted our theme to the people, equipped them with materials, and gave them hotlines to report to the district assembly if things were going wrong. The political party at that time even benefited from this program because they used it as an opportunity to know the local people from their doorsteps. It worked perfectly from all angles. A similar thing could be done to tackle the Ankobra pollution. The institutions must go to the people because the community is the first point of call. We need to empower the local people through education and sensitization at the local level” (Participant G3)

5.7.2 Conflicts among users of the river

One of the themes that came up during the interviews was the several forms of tensions that actor groups encounter while going about their responsibilities in managing or using the resources in the river. The users of the river in the communities described the different perspectives

on the use and management of the river because of the conflicting interests of the various stakeholder groups. One of the situations was the local people against the Chiefs who give lands to foreigners. The Traditional authorities who are beneficiaries of royalties from the mining activities are alleged to negotiate deals that enriches themselves at the expense of the community and environment.

Compliance with conservation strategies and the fight against galamsey for the river has particularly become difficult because of the various interests of the different user groups in the community and those in authority at the traditional, district, regional and national levels. The fishers, in particular, who have lost their source of livelihood due to the heavy pollution of the river, were particularly indignant about the behavior of illegal miners. This, T3 described as “disturbing.”

“When you tell the galamseyers to stop operating in the river, they do not mind. Because I am a fisherman, they perceive that I want the river clean so I can get my fish which is really disturbing because that is not the case. The river is for us all and the future generation. There is always a conflict between fishers and galamseyers. Even though they also need fish for food, they do not mind because they can afford to buy from somewhere else. They do not care about anything. They rely on galamsey”

Majority of the farmers and fishers that were interviewed felt they had been stripped of their only source of livelihood, much to the neglect of the traditional and political authorities in the communities. Even though the galamsey activity in the Ankobra river was not practiced in the two communities, the fishers who fished upstream stated they had unpleasant encounters with the galamseyers several times. According to them, though the river flows into the Gulf of Guinea, every community is aware of their boundary which means not much can be done by the residents from other communities unless government intervenes or the chiefs of all communities along the river collectively agree on fighting galamsey activities which is almost impossible to achieve. Since sub-chiefs of communities have different interests in the use of the river, the only solution according to T2 is to tackle this from the paramount chief’s office. The paramount chief according to him has the power to sanction any sub-chief who allows foreigners or indigens to engage in galamsey activity in the river.

“The galamsey operators pass through the sub-chiefs and the paramount chiefs to get permission to commit these acts. They should be held responsible for what is happening. They should be arrested for what is happening in their community. The Omanhene (Paramount chief) should give an order to his sub-chiefs and hold them responsible for the actions in their communities. If this is done, the sub-chiefs will rise against galamsey.”

He further suggested that radical action was needed to evacuate the galamsey operators from the river. Explaining some of the causes of conflicts and challenges in managing the estuary, Participant G2 also suggested that livelihood in the rural areas propel them to engage in these illegal activities irrespective of the input by the government and other committees put in place to stop galamsey activities. He shared;

“...As I have always said, livelihood is one of the things that affect the way we think and do things. So, if someone is home unemployed, when there is an opening to engage in illegal mining, it will be taken. They will do anything to make money, and gold fetches a lot of money. So, they would rather destroy the resources of the future to survive now. So, providing a relatively high, more stable source of income would prevent them from engaging in this illegal mining.”

In tandem with G2, Participant G1 was of the view that the community only wanted to mine because of the money they get from the galamsey. He suggested that once the galamsey is fetching them money, the people do not care about the impact it has on the environment.

“No, they want to mine. And that, for me, is not necessarily an issue. The government could say that, okay, if you want to mine. Let us organize ourselves, you can have your mine, then at the same time, we can have the environment. You can keep the balance, stay away from the river. But you know, when the ban was lifted, the idea was that nobody should go in on the river but that did not happen. The government is not against the communities mining but it the way they do it.”

5.7.3 Division of roles in the management of the Estuary

Stressing on the challenges that the separation of roles among the various government institutions and other stakeholder groups had on managing the river in the communities, participants described it as a major contributing factor to how the pollution of the river has been managed over the years.

“One major issue is the illegal small-scale mining, popularly known as “galamsey.” We need all the stakeholders to put in maximum effort to address it. Everybody is doing well, but they can also be faulted. Those who have access to land will need to bring in their equipment through the roads. So, the MTTU can work hand in hand to prevent them from bringing in their equipment. But because of the separation of responsibilities, we are not able to be very effective.” (Participant G2)

Not only has the separation of roles impeded the response on the side of institutions that have the responsibility to manage the river and its related natural resources, but it has marginalized some institutions within the decentralized framework. The Local government responsible for the municipalities i.e., Ellembelle and Nzema East Municipal Assemblies, have had little to do with the fight against galamsey and pollution of the river. During the interview with experts representing the two municipal assemblies, he expressed his concerns about how his work is limited by less support from other government institutions and even the heads of the representing assemblies.

“We were changed from a division under the ministry of health to a unit under the local government. Under the Ministry of health, we used to have cars to go on patrol. However, under the local government, you are not given anything. No form of transportation. I do not even have a laptop to write reports. I have to go out to write my reports” (Participant D1)

To him, District Executive Officers represent the President of the State in the municipalities, hence, if there are any resolutions to the situation at hand, they must champion the course and make their interests clear. Most of the participants agreed that the local government in the communities is “weak.” Some state that there have never been visits from the DCE or their

representatives except for electoral purposes, which they believe is for their personal gains and not that of the community.

5.8 Collaborative Management

This section covers the views of the participants on collaborative management practices. As a specific research object to examine the role collaborative management could play in the restoration of the river, participants were specifically asked if collaboration among stakeholders was the way to go in dealing with the galamsey and pollution in the communities. While it is expected that decisions on the management of pollution reflect the vision of the central government, and the approach to which these decisions were made, taking the order of a top-down approach, the inclusion of the people on the receiving end were prioritized to understand their needs and views on these decisions.

5.8.1 Community Inclusion in decision making

Residents in the communities, including the traditional leaders, fishers, and farmers, as well as youth and women, were asked about their participation in decision-making concerning the Ankobra pollution and if they felt their voices were heard or not. The general impression was that their voices were marginalized but cut across different dimensions.

For instance, speaking to T1, who is a traditional leader, he emphasized their power levels as community leaders in decision-making while stating that they were willing to support the government in whatever decision they made.

“We do not have any power to decide what should happen so if you have come to help us, our strength depends on the interventions of the government. If they decide to take measures, we will also support them.” (Participant T1)

Specific reasons were not stated for this assertion, but another participant hinted during an interview how risky it was to be involved in anything related to decisions made on the galamsey operation. He shared;

“Unfortunately, the community do not have any say because the miners who come...if indigenes want to say anything about the Ankobra, where you sleep you will not

like it [proverb in Akan meaning someone will be in trouble]. If you take communities like Dominase, they always complain.” (Participant D1)

Participant T2 also shared similar sentiments when asked about their participation in decision-making on the galamsey in the area.

“Sure. It is, but what can an individual like me do? I cannot fight them on my own. Some even carry weapons. I would put myself and my family in danger by doing that.”

Silence, according to these claims is the best option because protestors put themselves at risk and are vulnerable to any form of attack from the powerful people involved in the galamsey operations. This could be the reason though much is expected from the traditional leaders in the communities, they are not able to help since they put themselves in a vulnerable position.

Undeniably so from the comments from traditional leadership in the communities, R2 shared that the residents and those affected by the pollution, i.e., fisherfolk, voice out their frustrations to the local traditional authorities and have the liberty to do so, the only problem is that there is a feeling their frustrations do not get to the higher authorities who have the power to make decisions on their behalf to stop the pollution. He added that since the galamsey that has led to the pollution of the Ankobra is from upstream communities, the only thing they could do is wait on the government’s decision.

“Yes, authorities in the community have heard our cries on this issue for quite a time now, but we feel it is not getting to higher authorities. You know we do not practice the galamsey in this community, so we do not have the power to make any decision. The decisions are to be made in those communities upstream.” (Participant R2)

5.8.2 Co-management Approach to decision making

This section required participants to express their views on the need for collaboration between the local people affected by the pollution and interest parties, i.e., government institutions, traditional authorities, and NGOs. All the participants were open to the idea of collaboration because it brings to bare the interests and concerns of several parties into decision-making. The

central government through the ministry of Lands and natural resources has been the main decision maker in the galamsey and the impact on the environment. The recent decision to ban galamsey was just like previous ones, which took the form of a top-down approach.

During our discussion, Participant G1 stated that there was a need for the government to intervene because of the dynamics across several social and political factions. Particularly, the failure of the local system of governance in dealing with the situation, opposition political parties instigating the locals against government interventions, and reports in the media.

“In terms of decision making, there are some decisions you cannot even engineer at a local level. Like you want to impose a ban for instance, you can to some extent, but at the end of the day, ultimately, it comes from the top. But this comes after a long period of trying to find a solution to the issue. I have been part of some of the earlier committees’ task forces that were trying to deal with the issue of galamsey in a different government. In the approach, you find that the local systems have failed to regulate. So, why did they fail? It is because most of the people there have been compromised. Otherwise, the process at the local level should be able to deal with this.”

According to G1, the top-down approach to decision-making is not imposed on the locals but due to a failed local government system. According to him, the regulators at the local level are responsible for ensuring a proper management system on the river and the resources that come along with it. He shared;

“It does not really require a ban. If for instance, the district assembly, because they are part of the process of granting a concession, usually they will do some consultations and even issue no objection letter to that effect. If the security systems fight up to it, the EPA system is up there ready to help address the environmental issues. We have the social systems, also traditional authorities who seemingly have the ownership of the land, but the moment you find gold on it, it is not yours, is an arrangement for you to benefit from it.”

Mentioning key actors such as the district assembly and security, he further revealed that the logistics involved in sanctioning military patrols, as a result of the ban on all small-scale mining activities and its related legal concerns, were ‘costly’ and so it is necessary to collaborate with the local people specially to solve the issue of galamsey and the pollution. He shared;

“Yeah [response to if collaboration with local people and other stakeholders in decision-making was necessary] because the source [of pollution] is from the community [the people], so you need to work with them to solve it. The polluter is responsible for addressing the pollution, and if we work together to address this, we can solve the problem. If we continue to do it from the top like we have done in the past, you may win for a period, but you ask if it can be sustained because of capacities that extend several tax sources into that field. How many days can you spend, and at what cost? The resources you need to do and keep the system running are very expensive. Right? So, if you are going to keep the military on the field, it is not sustainable.”

In tandem with the suggestions of G1, Participant G2 also stated that collaboration was “the way to go” if the galamsey and its related pollution were to be resolved. He suggested that even though there would be challenges, a solution through collective purpose could be achieved if the interests of the various stakeholders were explicitly revealed.

“It is the way to go. I think all stakeholders should be able to come together and work hand in hand to effectively manage the resource but only when all stakeholders bring on board their interests. Of course, there will be conflicting interests but together we can prioritize and set the agenda to restore the river. If one part of the river is polluted it will certainly affect the whole river. So, there is actually no point in working individually until we come together. There must be constant communication between the different agencies in order to mitigate whatever issues arise effectively.”

Some of the local people also agreed that collaboration among the various actor groups was needed for effective management of the river. Participant R5, as with many others explained that the government’s role was important to the management of the river but so is that of the local people, hence collaboration between the parties to him is ‘definitely’ the best solution to the issue.

“Definitely, this method [collaborative management] would be the best way to resolve the problem because if government is doing its part but the local people are just watching the government would just be suffering for nothing. I also think, if there is more training and education of the public it would really help.”

He further stated that it was necessary for the government to sensitize the local people through training and public education at the local level. This he suggested would help the collaborative effort on the part of the local people.

Participant R2 also mentioned collaboration among traditional leaders, government authorities, and other parties would contribute to the restoration of the river. He specifically stated that it is required for the traditional leaders in the communities to collaborate and fight the galamsey.

“Yes, it is we coming together to work towards something productive so if we all collaborate as a community and take action against the pollution of water bodies, I strongly believe water pollution would reduce if not be completely resolved. If the chiefs should come together and fight against galamsey, it will help solve the issue. Then the government will set the tone for them.”

5.9 Empowering the local people

After several years of conflicts on the decisions made by political leaders on the mining business in Ghana, the “community mining initiative” by the Ministry of lands and natural resources has been implemented with the aim of giving the local people the power to manage their own resources and mine sustainably. The aim is to conserve the resources for the future and to ensure that the local people not only benefit from their own resources but are involved in decision making regarding the utilization of the resource. Community Mining is intended as a dual management approach targeting pollution reduction and community development. This strategy has proven to be effective for wildlife conservation in the upper regions of the country, but has yet to be successful for the management of small-scale gold mining.

Discussing the importance of the community mining program and its benefit to the sustainable development of the mining communities, G2 stated that the initiative was to provide the local people access to their own resources. In his view, most of the local people do not benefit from the resource and are exploited by foreigners who after extraction of the resources leave the community people in ruins and a degraded environment.

“It is a relatively new initiative. The main purpose behind it was to allow the indigens in the communities to have access to their resources. As opposed to allowing foreigners to come, mine and leave the inhabitants with peanuts.” (Participant G2)

Respondent G1 also added that the community mining was a means of creating a permanent solution to the conflicts of top-down systems such as banning of small-scale mining due to overexploitation and illegal practices. He added that the initiative went through a thorough multi stakeholder participation process to provide inclusion of several voices that are key to understanding the needs of both the local people, investors, government sectors and other relevant actor groups in the management of the river and its related resources.

“Now we have to put in a more permanent solution. Community mining is also a response, not only from government, there have been several meetings, stakeholder consultations, organized different for at different levels, different regions, trying to listen to people, the miners and also involve the regulators or the politicians, the traditional authorities, the security system, they all come together. It is a very organized processes to ensure that, at least at the community level, there is a structure and I think it is informed also by the community, if the community is doing mining and the people own the mine, they are not more likely to degrade their own lands and walk away, you can put faces to it.”

According to G1, the community mining is the best solution to give legitimate power to the people in deciding the extent to which the resources will be used. As opposed to the traditional bureaucratic governance system that does not necessarily represent the concerns, interests and needs of the local people.

In agreement to the above statements, participant D1 also stated a few concerns with the community mining approach. He insisted that the initiative be explained to the local people because the previous practices which led to the pollution were conducted by foreigners who did not necessarily care about the sustainability of the resources. Even though the idea of the community mining is to provide the local people legal permits to mine, he argued that due to lack of finance, foreigners will again manipulate the community system to get the permits which cause pollution to reoccur.

“.... most of the mining was done by foreigners who did not really care. So, if community mining must be done, the government must explain very well to the indigens. Most of them cannot engage in mining because they do not have the logistics. So, most of

the foreigners come and sometimes employ a few indigens. When they get their money, they leave the town and return to where they came from.”

His main argument is that if we are to give power to the people to do their own mining and to manage the extent to which pollution and degradation is done in the communities, there should be a system that monitors and empowers the local people financially so as to not allow foreigners (both local and international) manipulate the system due to their financial advantage. Indeed, this has been one of the main reasons for the pollution reoccurrences because those who care about the environment and the livelihood it provides for them are not financially capable of mining sustainably which opens the market for foreign investors who do not necessarily place the socio-cultural heritage, the livelihoods, and future implications of their actions on the community at the center of business.

Chapter Summary

The chapter focused on the results obtained from conducting participant interviews, focus group discussions, and observations, which provided insights into how people perceive decision-making processes and management strategies that can ensure the sustainable use of the Ankobra River. The responses from the participants highlighted various themes that indicate the complicated relationships between stakeholder groups and the conflicts among users of the river. The major issues identified included conflicts among users, alleged corruption involving government officials, traditional authorities, and galamsey investors/miners, the lack of collaboration among government institutions responsible for managing the river, and the conflicting role of traditional leaders in contributing to the pollution. The participants also expressed concerns about the impact of pollution on the local community's livelihood and recommended that the authorities take swift action to prevent further harm. This reflected how the local voices had been marginalized in the decision-making and had to depend on external interventions. The chapter concluded by discussing the participants' views on collaborative management and why previous government regimes favored a top-down approach. These discussions laid the groundwork for the next chapter, where the data is analyzed using a power analysis that considers the social structures that define interactions and the actors' ability to make decisions based on their social, political and institutional positions in society.

CHAPTER SIX

6. Discussion and Conclusion

Introduction

In this chapter, the focus is on the different ways power is legitimized in negotiations surrounding the Ankobra basin and its resources. To fully understand why managing galamsey practices and the pollution they cause is challenging, it can be useful to examine the country's relevant socio-cultural practices and systems through the lens of Isaac's theory of power, as discussed in earlier sections. The chapter therefore reviews the relevant national policies, institutions, systems, and socio-cultural practices by actor groups at the national, and local levels. The chapter also examines power dynamics in decision-making processes, stakeholder representation, and the impact of mining activities on local livelihoods.

6.1 Impact of Pollution on Local-Livelihoods

The findings of the study, based on interviews and discussions with local communities and NGOs who have worked on projects in the area, indicate the detrimental effects of pollution on various aspects of the communities' livelihoods. Agricultural activities, drinking water, and cultural systems have all been significantly affected. Fishing, a vital part of the local culture and economy, has been severely affected, leading to a diminished sense of belonging within the community. Furthermore, the pollution of the river, which also serves as a source of drinking water, has resulted in the need for costly treated water, which most residents cannot afford. Many expressed concerns about the health implications of drinking from the river and the impact on the well-being of community members who have little power in decision-making. The only solution most suggested was for the government to pronounce another ban on all small-scale mining activities to restore the river and the community.

Adelekezo and Eziome are lower Ankobra estuarian communities that are victims of illegal mining activities upstream of the river. Contrary to many reports on how galamsey had improved the livelihoods of local communities in the form of providing viable and high-profit jobs to the local residents, the results in these communities showed a significant negative impact on quality of life and the environment. Ali concurred to this finding as he reported that galamsey activities had negatively affected forest, agriculture and water bodies (Ali, 2022). Some individuals within

the upstream Ankobra community who practice illegal alluvial mining activities do experience financial gains, whereas those in the downstream areas only experience the negative impacts of pollution. The pollution from mining activities has led to a decrease in fish population and even extinction of certain local species, resulting in job losses for the fisherfolk and a sense of hopelessness for the community. According to Hen Mpoano's report, the majority of Adelekezo's inhabitants, exceeding 80%, rely on fishing as their primary source of income (Hen Mpoano, 2016). This finding indicates the level of disruption of the pollution in the fishing industry which has had significant and far-reaching economic consequences for the community.

During fieldwork, the villages were often empty throughout the week because of the lack of economic activity. The market women who used to be fishmongers had to sit with their children, who were not able to attend school due to lack of finances.

The use of chemicals in irrigation has adversely affected subsistence farming, which previously provided a means of support. Adelekezo and Eziome have limited viable livelihood options, leading to a migration of community members to neighboring areas to participate in illegal activities such as galamsey operations and illegal logging of trees. Additionally, due to the lack of alternative sources of income, a significant proportion of youth have left the community. According to the World Bank, Ghana experienced high levels of youth unemployment, with a 12% rate and over 50% underemployment in 2020, surpassing the overall unemployment rates in other Sub-Saharan African countries (World Bank, 2020). This situation has not changed, as the Annual Household and Expenditure Survey revealed a 13.9% unemployment rate in 2Q of 2022 (Ghana Statistical Service, 2022). At present, there are only a small number of young people left in the communities, and they mostly work as motorcycle drivers to transport people to farms and nearby areas. The individuals who are still residing in the community are struggling to make ends meet by relying on the crops they grow. They have expressed a desire for a solution to be found that would involve the restoration of the river and the revitalization of the community.

The next section delves into the socio-cultural practices and systems that shape decision-making and power dynamics in the Adelekezo and Eziome communities, shedding light on how they impact the management of galamsey operations in these areas. Understanding the socio-cultural practices and social structures that underlie decision-making and power dynamics is crucial for effective management of natural resources. I begin by discussing the levels of power

that identified in the data, the actors involved, and the structures that provide them with the social capacity they have to exercise power over other stakeholders and within institutions.

6.2 Levels of Power in managing illegal mining and its associated impacts

Throughout the study, several stakeholders have been assessed on their influence in decision making and how that affects the management of iASM and associated impacts. This section uncovers the power of relevant actors in managing the Ankobra basin and its resources, the key arguments raised from the interviews and discussions with participants in the local communities and among government institutions. Segmented under macro and micro levels of power, I explain how these power relations have shaped the mining industry, and the reasons why iASM and pollution has persisted irrespective of interventions.

6.2.1 Macro-level power relations

As posited by Isaac, the historical social structures of a society determine the power relations between actors (Isaac, 1987). In order to understand the enduring relationship between actors in the mining industry and the outcomes of decision-making, it is important to consider the structures that define the power individuals possess and the policies or norms that ensure the exercise of this power. In this study, the government's role in deciding what needed to be done to curb the pollution of the Ankobra was emphasized by all actor groups including the local community, who stressed that the central government had a legal responsibility of ensuring the control of illegal mining and its pollution in the communities. The authority of the government and how it manifests through the management of natural resources is onwards categorized under the macro-analysis of power relations. The power of the national actors according to Ofori (2015) manifests in resource ownership and policy-making. Similar to several other African countries, the Government of Ghana possesses supreme executive power, which could be seen as a form of social dominance due to the power it confers to the executive arm of government. As noted previously, the constitution of Ghana confers executive powers to the President of the State to own every any land that possesses minerals and to also control the issuing of mining contracts (Akabzaa & Darimani, 2001). Thus, the President is the owner of the alluvial gold being mined in the Ankobra, and is responsible for the decisions taken to manage how it is mined. This, I contend, is the first exercising of power in the management of the Ankobra basin that has resulted in the

marginalization of other stakeholders and the domination of key political figures responsible for the over-exploitation of the river and ineffective inclusion of the local voices.

As gathered from the interviews and discussions, most of the local communities believe that the government has a hand in the illegal activities going on in the river because they provide legitimacy for operation through permits, has the capacity to enforce discipline or prosecution to illegal operators, and assign institutions to enforce the law. This to most of the local research participants was hard to comprehend that the government would allow the river to be exploited to this level having all these capacity at their disposal which suggested that there was an informal or unlawful negotiation in the iASM operations that benefited the Presidency or political parties. The government's focus in recent times has been to encourage ASM and has acted within its power of resource ownership to take mineral-bearing lands from communities and make them available to mining companies ready to invest in the industry. The accumulation of power based on tenure arrangements by political elites is emphasized in the political ecology scholarship. Ofori (2015) provides an illustration of how political leaders tend to convert communal lands and resources into state-owned territories through tenure agreements and management practices. In some instances, there have been claims that certain political elites have even appropriated state lands for their personal use while serving in office ([link 5](#)). These actions highlight the propensity of political figures to prioritize their individual interests over the common good while leveraging the power they possess as political leaders. It is therefore legitimate for the local people to perceive that ineffective management of the iASM activities and its pollution in the communities is a deliberate effort of political elites who have the power to decide access to and use of the resources for their personal interests.

The policies and regulations enacted by the government are another means by which power is exercised at the macro level. The significance of government policies and legislation in natural resource management is emphasized by Leach, Mearns, and Scoones (1997). Such initiatives encompass land tenure reforms, policies, or approaches that aim to promote sustainable use and conservation of natural resources. The government of Ghana through laws and policies related to mining, demonstrates dominance in decision-making regardless of the community's concerns. According to Aryee et al., (2003), the government's policy-making process is centralized in government institutions, and unfortunately, there is no culture of community engagement, especially when it comes to policy formulation regarding natural resources. Over the years,

different Presidents have declared a ban over ASM. This decision mostly has resulted in clashes between local communities and government institutions (Ali, 2022; Banchirigah, 2008). Nevertheless, the study's findings revealed that despite not being involved in the initial decision-making process regarding the ban, the local participants acknowledged its effectiveness in restoring the river. It was no surprise that most of the participants suggested that the only way to get the galamsey workers off the river was for the government to pronounce another ban.

It is clear that the local people depend on the policies the government makes, placing them on the receiving end of decision-making and power positions. This is an enduring relationship that has existed for several years since colonial times and started with reforms and impositions on ASM. Local communities have had to depend on the policies of the central government when it comes to natural resources without initial participation in decision-making. Despite the positive outcomes observed with some of these policies, the ones that encourage ASM production especially have had negative environmental effects. Policies such as privatization of local resources and foreign investments have often not translated into development as planned. One of the major contributions to foreign investments in ASM recently has been that of the Chinese through technology and labor force. According to Bryant & Bailey (1997), the privatization of local resources in the name of modern development has often been associated with disrupted livelihoods, cultural genocide, and degradation of local environments. Ali (2022) contends that the devastation of natural resources due to unlawful mining activities in rural areas of Ghana can be attributed to the introduction and implementation of Chinese technology. As observed during the fieldwork, Chinese immigrants are said to supply local galamsey workers with mining equipment from Chinese stores established in nearby cities. The application of these technologies has led to the pollution of the Ankobra river. While foreign investments and the privatization of local resources hold potential for development, particularly in large-scale mining endeavors that have facilitated community development through corporate social responsibility initiatives, the opposite is true, which is the reality in many resource-rich countries. This further supports the argument in the field of political ecology that the abundance of natural resources frequently becomes a curse. In the case of rural communities, this curse manifests as conflicts between mining investors and fishermen who have lost their means of livelihood due to river pollution, as well as with farmers who have also been adversely affected, as demonstrated in this study. There continues to be an

increase in youth unemployment, a lack of access to land, and environmental degradation in Adelekezo and Eziome.

6.2.2 Micro-level Power relations

In the previous section, it was revealed that the power exercised by the government through tenure arrangement and policies related to environmental resources affects local systems. Consequently, the government institutions represented at the local level, the traditional leadership, political and economic elites, and local users of the river in the local communities exercise a level of power in their interactions related to participation in decision-making, management, access, and utilization of resources. These interactions among these local actors mentioned above are very important in understanding the localized effects and lived experiences in managing Ankobra river pollution. Local authorities such as traditional rulers and local government institutions have received lots of public attention and criticisms in recent times over the alleged involvement in iASM activities in their localities. The following paragraphs discuss the actions of these actors and how power plays out among stakeholders in the Ankobra case.

As discussed in Chapter two, the management of small-scale mining historically was the responsibility of traditional authority through Chiefs. The power of chiefs to manage community resources has continued to decrease over time following the formalization and reforms of the colonial era and after independence. Chiefs, representing the community, have surface rights to every customary land, which means that even when minerals are found in their area, they have the capacity to decide, to an extent, how it is managed and are beneficiaries of the profits through royalties (Lawer, Lukas, & Jørgensen, 2017). This informal/formal law means that for any collaborative effort to be effective to manage the river and the pollution from illegal mining, the traditional leaders must be included. Before any individual or organization can start an operation in a community, they first visit the traditional authorities for a social license to operate (Asori et al., 2022; Lawer et al., 2017). Though alluvial mining is not practiced in Eziome and Adelekezo, this does not also mean they might not have stakes in some of the business going on as Banchirigah discovered it was the norm in communities such as Tarkwa and Noyem, where traditional leaders owned galamsey companies (Banchirigah, 2008). The issue is, there have been historical exchange and transaction of power between higher political authorities and local chiefs in the form of electioneering, where political leaders seek favor from traditional authorities to help them in their

campaigns and influence their community members to vote in their favor. In return, policies and regulations that are intended to function as part of the management systems are breached at the local level because they helped the ruling government to gain political power. Indeed, it is impossible to enforce regulations upon the very entity that granted you authority in the first place. This longstanding system, spanning several decades, has led to injustices and disruptions in the efficacy of decision-making processes within local communities.

The majority of research participants, both locals and government representatives, acknowledged the role of traditional leaders in combating pollution. As stewards of the land, it was commonly believed that while government authorities are required to enforce regulations, it is their customary right to protect community resources; however, this was not the case in the communities along the Ankobra estuary. Some even alleged that the chiefs in the areas along the Ankobra basin had interests and investments in the illegal operations as presented in chapter five. The data gathered also suggest that traditional leaders in Adelekezo and Eziome have limited authority to address the issue of galamsey and its accompanying pollution and this is the case for most rural communities. In her research, Ofori (2015) discovered that the traditional leadership and community of Noyem had little say in how their resources were used, and there was often no prior consultation or consent before lands were appropriated by the government and given to large-scale mining companies. Similarly, Ali also reported how agricultural lands of community members were destroyed by galamsey operators without their consent having received the go-ahead certain “powerful” people (Ali, 2022).

Some of the traditional leaders in Eziome and Adelekezo suggested that the real local beneficiaries of the illegal mining operations were those at the higher (paramount or regional) level of the traditional council since they had a larger political and traditional influence. The local communities rest on the local chiefs, the local chiefs rest on the decisions of the paramount chiefs, and the paramount chiefs that of higher political authorities. The paramount chiefs ignore the sub-chiefs when making decisions, which depicts the inequalities within the traditional council. Also, it could mean that some of the sub-chiefs are pushing the blame on the paramount chiefs in order to avoid pressure from the local residents, which further gives them the legitimacy to engage in galamsey for personal gains. It could also mean that the local chiefs are saying this because they don't receive some of the royalties that go to the paramount chiefs. The question then is would they (local chiefs) complain if they were the ones benefiting? There is not enough evidence to also

prove that the paramount chief in the traditional area is involved in illegal activities, though they receive royalties from the lands sold to investors for the purpose of mining. Another thing to consider is if these allegations were true, would the local chiefs act differently if they were the ones receiving the royalties or if the alluvial mining in the Ankobra was practiced in their area? One thing however is true, that power capacities attached to social identities restrict others from taking responsibility and involving in decision-making.

The traditional authorities in Eziome and Adelekezo acknowledged the potential for conflict between communities if they were to interfere in each other's boundaries. Even though they acknowledged their social power to intervene for change, their 'real interests' were compromised by certain internal factors. In the past, the Eziome community had a conflict with a nearby community that resulted in its depopulation. While the traditional authority's objective interest is to tackle the galamsey and its related impacts, their real interest is to protect the village, the heritage, and the few people left against another conflict that can arise from their interference in another community's jurisdiction even though it affects them. In so doing, the Chief of Eziome is performing his duties as a traditional leader with the mandate to protect the cultural heritage of the people, but his capacity to intervene for change is also limited by the actions of another actor. This proves the complex nature of traditional bureaucracies and interests among local Chiefs that hinder the involvement of local leaders who are believed to be intervening for change.

The government wields power through ownership and policy-making, while traditional authorities leverage their traditional and customary influence in negotiations surrounding land and related resources. Similarly, local individuals also exercise their own form of power. During interviews, the fisherfolk recounted conflicts with illegal miners regarding the impact of galamsey activities on their livelihoods. Both groups view fish and gold as valuable resources to be exploited, but the fisherfolk are disproportionately affected by galamsey pollution, which has led to declines and local extinctions of fish populations. The galamsey miners hold significant power over their fellow fisherfolk in society, as they have been able to persist with their operations despite pressure from fishers. As evidenced in the data, the galamsey operators have turned a deaf ear to the local population's cries and have continued to mine, even during periods when galamsey was officially banned. They have skillfully navigated the system to withstand pressure and opposition from local residents and government authorities by utilizing bribes and other informal practices. The literature review documented instances of military personnel collaborating with the miners, which led to the

complete lifting of the ban by the government due to the compromised security system. Robbins asserts that conflicts over natural resources primarily arise due to certain actors' power to determine how resources are allocated, accessed, and utilized. (Robbins, 2011).

Studies have shown that miners have the backing of powerful actors in the society including traditional authorities, and this puts the fisherfolk, who are entitled to use the river as a source of livelihood, in vulnerable position. Ali (2022) similarly found that most local conflicts arose from the frustrations of farmers and fishers about how traditional leaders and galamsey operators control access and use of the resources to the detriment of other users in the communities. According to (Jackson & Pradubraj, 2004), conflicts can occur between those who want to use and those who want to protect a resource; or increasingly, between those who make decisions on resource allocation and use and stakeholders. Conservation and exploitation are central to discussions in political ecology. How different stakeholders perceive a resource and how it is used, with differing opinions on how the common resource should benefit all parties. The fisherfolk and farmers are as much entitled to the resources as the galamsey operators but without a common interest, conflicts will persist.

Lastly, I address the prevalence of informality, corruption, and dereliction of duty among certain actors at the local level of social relations, as evidenced throughout the data. Building on the material from chapter two, here I discuss how actors at the local level leverage on the weak governance system characterized by bureaucracies and corruption for their personal gains. According to Crawford & Botchwey (2017), Ghana's system of government is neo-patrimonial which shows decentralization, bureaucracy, and informal practices. Although Ghana has numerous laws and regulations, their implementation has always been a challenge, raising the question of why the laws and institutions in place are not effective. There are two possible explanations for this problem: firstly, the roles are divided among institutions without clear coordination, and secondly, the patron-client network allows individuals to use state resources and power to gain loyalty within a bureaucratic system. Local participants consistently pointed out corrupt activities among those who hold decision-making power at the local level, and it was challenging to find any instance where such allegations were not made. As Ali (2022) asserts, most local people see the government and other key actors as competitors in the management of the river and its resources. Chiefs were specifically accused of engaging in wrongful negotiations that fostered illegal small-scale mining (iASM), along with the Municipal and Metropolitan District Assembly

(MMDA), Security Agencies, and Environmental Protection Agency (EPA), as well as local residents who sold their lands to galamsey miners for failing to fulfill their social responsibility. As long as certain individuals in the chain of management can do what they want without effective supervision and accountability, corruption and informalities leading to iASM and pollution of resources will persist.

Rather than promoting the conservation of the river, the general perception among many local community members and fishermen is that the government and the traditional leadership are competing with the local folks to exploit the river and its resources for their personal gains. This is the form of power Isaac highlights as the capacity agents have based on the norms that define relationships in society. Individuals in the various institutions of the society can obstruct others in performing their duty because they have the power to do so. This reveals why collaborative approaches have not entirely achieved any success in dealing with the Ankobra pollution over the years. In the following section, I will discuss in detail how these informal norms and practices have impeded collaborative efforts and will eventually repeat itself in any other approach if proper strategies are not implemented to tackle corruption and informalities which has been the main issue in iASM.

In summary, power dynamics are ubiquitous in society, permeating various levels of the society. Within institutions, individuals exert power over others based on their hierarchical position. Additionally, legal frameworks, such as constitutions, grant power to specific individuals, thereby creating disparities in dominance among local actors. Moreover, local actors possess social capacity through entitlement, with those involved in the mining industry wielding more power than fisherfolk due to the former's significant impact on and control over resources. As a consequence of these factors, past endeavors to incorporate multiple stakeholders in ASM management and impact mitigation have proved inadequate. The following section delves into the underlying characteristics that lead to unsuccessful collaborative efforts.

6.3 Decision-making process and barriers to Collaborative efforts

Collaboration among stakeholders is emphasized in several scholarly contributions that address the management of community natural resources. According to Soliku and Schraml (2020), co-management can help mitigate or prevent conflicts from escalating when conflicting parties engage with each other in a transparent manner. Selin and Chevez (1995) also asserts that

collaboration can be an effective strategy for invoking the public's sense of social responsibility to share in the stewardship of our natural resources. This section aims to elucidate the perspectives of various stakeholders for a collaborative model in the Ankobra River. I further analyze the nature of collaborative management approaches and the main features that has accounted for its ineffectiveness, dive into dynamics of the CMS which is newly implemented collaborative approach and lastly reflects on the existing social structures and norms that reify a dysfunctional system of management.

6.3.1 Inefficient Legal Frameworks on collaborative management

ASM has been through regimes that resulted in providing a tentative legal framework that ensures the collaboration of various institutions and stakeholders at the national, regional, and local levels of government, and traditional communities. Together with this, the establishment of separate laws and strategies by individual government institutions such as IWRMP by the WRC ensures a platform for inclusion of different stakeholders in the management of the Ankobra. Despite significant success in establishing offices and constructing a decentralized system for managing the river by the local government, these legal frameworks remain a piece of paper when dealing with iASM. Why would policy-makers implement another strategy if the IWRMP was working well to deal with its main problem (iASM)? According to Søreide and Truex (2013, p. 208), “multi-stakeholder processes generally emerge from the recognition of the weakness of other mechanisms for sector governance”. Recognizing the need for Community Mining Scheme suggests that decision-makers know the legal frameworks have not worked out well. This can be attributed to various factors such as lack of coordination and communication among government institutions, inequalities in the chain of decision-making due to bureaucracy, and lack of community involvement among others.

According to Crawford, institutional failure is one of the major issues contributing to increased illegal mining activities and its negative impact on environmental resources (Crawford & Botchwey, 2017). As seen from the data presented in Chapter 5, there is lack of coordination and adequate communication among institutions. The government institutions seem not to work as a collective but rather individual entities. This, to some of the interviewees was a major challenge to collaborative efforts and the effective implementation of the strategies. Selin and Chevez (1995) argue that the institutional culture within many agencies often hinders collaboration

listing dominant centralized, rational-comprehensive planning process as impeding factors. In Ghana, the government institutions usually work independently and this makes it difficult to achieve a collective goal. Before I began my fieldwork for instance, I had to submit letters in person to all relevant ministries separately, rather than to one place where the letter could then be distributed throughout the system. This impedes the flow of information between institutions. The institutional culture is staged such that if one institution fails to perform their duty, the whole system fails.

During the interview, the representatives from EPA, WRC, and District Assembly acknowledged the lack of proper coordination among them and highlighted it as a significant obstacle to establishing a successful collaborative endeavor. Bofo et al. (2019) acknowledged and even contended that the growing participation of Chinese in small-scale mining revealed a more significant and fundamental issue, primarily characterized by disjointed interactions between crucial state and traditional institutions. During the interviews, a representative from the EPA argued that the machines used by galamsey operators to damage the water bodies go through tolls and police checkpoints before reaching the mining areas and forests, but they are allowed to pass through by the MTTU authorities. The EPA, WRC, MMDA do not have the authority to stop the operators from taking their machines to these sites, as it is not their responsibility. Drawing from his assertion, if they MTTU are doing their job well, it will restrict access to destructive machines being used for galamsey purposes and the WRC and EPA for instance will not need to be battle with galamsey operators on the impacts of their actions. In another instance, if the EPA consistently checks up on their standards through patrolling all mining activities that has been granted permit to mine, the buffer zone requirements could be met which prevent the pollution of the river. In addition to the existing lack of collaboration among institutions, certain individuals in influential bureaucratic positions impede the performance of other government officials and agencies. This issue will be further elaborated in the following section.

6.3.2 Marginalization and Obstruction of duty among Institutions

The data revealed forms of marginalization and obstruction of civil duty within the district assembly, which contributes to ineffective collaboration for sustainable management of Ankobra. As Gray (1989) asserts, collaboration can be obstructed when one stakeholder has the power to take unilateral action. Based on the interviews conducted, it was found that local district authorities

have limited decision-making authority in resource negotiations. The majority of decisions pertaining to river management are made at the national or regional level, while the local district authorities are responsible for implementing these decisions. In the context of ASM management, Hilson and Potter (2005) argue that the ASM district offices often lack sufficient institutional support and funding. The representative from the district assembly during the interview expressed difficulties in effectively carrying out their duties due to a lack of support and logistical resources. Additionally, influential individuals within the District Assembly, who closely collaborate with the executive government, tend to wield unopposed power by unauthorized reshuffling of personnel, misusing funds, and obstructing the responsibilities of other agencies operating within the district

During the interviews, some participants raised concerns about the role of the District Chief Executive (DCE), who represents the president at the local level, in controlling illegal mining activities and addressing pollution in the district. Some even made allegations suggesting that DCEs themselves were involved in such operations. Interestingly, a few months later, news emerged regarding an alleged incident where the DCE of Ellebelle, the district where Eziome is located, prevented the police from retrieving an excavator that had been seized by security services during the ban on ASM (see link 1). When political figures who are entrusted with protecting community resources dominate certain government institutions, it becomes difficult to achieve cooperation. This supports Ali's argument that some political actors are actually competing with local residents in managing resources.

Community-based resource management emphasizes the importance of incorporating local perspectives and knowledge into environmental management. During the fieldwork, it was discovered that the government through the Ministry of Fisheries had conducted research on sustainable fisheries under the Sustainable Fisheries Project in Adelekezo and Eziome. This resulted in the establishment of a local community board responsible for managing fisheries and mangrove ecosystem resources in five estuarine communities. The project was facilitated by an NGO called Hen Mpoano, which oversaw its successful implementation over seven years. During interviews, many local community members mentioned their involvement in the project and emphasized the importance of collaboration among stakeholders to address illegal mining and the resulting pollution of waterways. However, they also noted that initiating such collaboration was

the responsibility of the government, as the community alone lacked the capacity to do so. This proves the willingness of the community members to cooperate with policy-makers in eradicating pollution but then also that they lack the power to initiate dialogue. Robbins argue that local perspectives on environmental management is usually to conserve community resources (Robbins, 2011). This is true in the study areas because the exploitation of the river has disrupted their sense of place and livelihoods. Their responses on the impact of governments ban also reflects how any future attempts to conserve the river will be supported and this case, through collaboration. The vital role that community members play in driving positive change is recognized by the government, and it is recommended that their voices be integrated into decision-making, policies, and management strategies.

6.4 Stakeholder Participation and Representation

The issue of unequal power distribution and hidden interests must be addressed to ensure fair and equitable decision-making processes. Some views on stakeholder participation suggest that including stakeholders in environmental decision-making can improve the perceived equity and fairness of the decisions. This is because involving stakeholders can consider a variety of interests and needs, while recognizing the intricacy of the relationships between humans and the environment (Reed, 2008). The concept of fairness in decision-making among stakeholders may be compromised by uneven power distribution and hidden interests. In Eziome and Adelekezo, many believe that their opinions are ignored, and their interests diverge from those of politicians and traditional rulers. This suggests that not all parties involved in decisions related to environmental protection, such as the protection of the estuary and the illegal exploitation of natural resources, are willing to take the necessary steps.

Regarding CMS, it is unclear whether it will fully resolve iASM and pollution problems in general as well as the Ankobra case. My argument is that if the current ASM laws and institutional processes are applied to the CMS, it will likely result in the same outcome that has encouraged galamsey workers to disregard the permitting processes, mine in the river, and led to minimal local participation in decision making. To support this argument, it is essential to examine the premise of the scheme, the policies that guide its implementation, and the potential for power dynamics to be reproduced. Through this examination, we can identify the factors that drive the implementation

of CMS, the policies that support it, and the ways in which power dynamics may impact decision-making processes.

6.4.1 Community Mining Scheme: Premise, policies, and power dynamics

The fundamental objective of community mining schemes are to guarantee sustainable mining practices in the regions where galamsey is prevalent, while simultaneously ensuring that community members have access to resources that enhance their standard of living (MINCOM, 2021). Although this objective is a lofty one, with input from a variety of stakeholders on sustainable mining practices designed to reduce pollution and enhance locally based livelihoods, it is predicated on the same policies and systems that have plagued the formalization and regulation of small-scale mining. I focus below the policies, which elucidate the power structures that they fail to address. In the following paragraphs, I examine the financial obligations of the policy and its impact on local involvement, the registration process that could hinder the licensing of community groups, its inability to address the issue of illegal alluvial mining activities within the river causing pollution, and the significant power imbalances within the multi-stakeholder group approach that may perpetuate the marginalization of local demands and the concentration of power.

As demonstrated in this study, power should not be viewed solely as the actions of individuals, but also as the capabilities they possess within society. The Community Mining Scheme (CMS) is governed by regulations which allow only Ghanaian citizens to participate and require organizers of the operation (including body corporates, cooperatives, partnerships, and sole proprietors within the community) to demonstrate a minimum investment capacity of GHS 100,000 (equivalent to NOK 100,000) to ensure local benefit and rehabilitation of the land after mining. While these regulations are designed to promote local investment, they create a potential loophole for foreign investors. In small rural areas, GHS 100,000 may be unattainable for many community members, resulting in outsourcing of foreign investment for assistance. This has been a common practice in informal small-scale mining, as local communities lack the capital required to register and operate in the mine. Ali backed up this argument as he revealed through his study that foreigners leveraged on the poverty of local communities to buy their lands for mining operations. The foreigners often work with the locals to purchase the land for a significant sum of

money that the locals cannot refuse, as it would take them a long time to earn that amount through their traditional livelihoods of farming and fishing. He further supports this by demonstrating how the local residents view this as an opportunity to obtain funding to support their families' education, healthcare, and even establish local businesses (Ali, 2022).

In an interview, Participant G2 explained that the government's role is to guide private individuals in operating the mine, rather than sponsoring community members in establishing the operation. This situation may give foreign investors an advantage, as they have the financial capability to operate and can connive with local members to register the company in their names and gain control, often without regard for environmental concerns. The majority of the resource-rich deposits are situated in rural areas, where the inhabitants rely heavily on subsistence farming and fishing as their primary source of livelihood. Without the availability of higher-paying alternative livelihoods in these communities that would enhance their financial capability to participate in mining activities, foreign individuals (both local and international) will continue to dominate the industry. These foreign individuals are typically more focused on their profits rather than their impact on the environment. Given that the local community members are unable to afford the cost of operation and licensing, the question that arises is whether the licensing process is actually intended for specific investors or for the local community, especially since the government does not offer any financial assistance to communities.

According to (Akabzaa & Darimani, 2001), another primary factor contributing to the differentiation between fASM and iASM are the challenges that operators encounter during the registration process. These challenges have led community groups to disregard the licensing requirements and proceed with their operations. Since CMS falls under ASM, it is governed by the same requirements of the Minerals and Mining Act 2006 (Act 703). There has been a lot of discussion about the improprieties involved in registering ASM, with some individuals in the licensing agencies taking advantage of the situation to gain profits. This emphasizes the presence of informal practices and bureaucratic hurdles within the governing institutions, which result in delays and create frustration in the registration process. (Tschakert, 2009a) asserted that most galamsey community groups were unrecognized and have been prevented from fully taking part in state-sponsored educational, financial, and technical services. Furthermore, they encounter various bureaucratic and procedural obstacles when attempting to obtain a license (Tschakert &

Singha, 2007). As Tschakert revealed, it sometimes takes 6 to 12 months for the Minerals Commission to respond to requests without any valid explanation and waiting fee for first-year as the time of his publication was around \$2,000. One could surmise that the delays are intentional and done intentionally to generate additional fees, which may be directed to personal accounts. This is normal for most public institutions in Ghana which is characterized by unreasonable delays in processing of documents. Beeri Kasser-Tee (2020), in their research on administrative corruption within Ghana's business regime, found that the primary cause of corruption was unnecessary delays. They argue that unless this issue is effectively addressed, corruption will continue to hinder the process of obtaining the necessary permits, licenses, and certificates required to start a business. This raises the question of how the registration process for Community Mining Schemes (CMS) will be any different, considering that these informalities have persisted despite the legalization and formalization of ASM.

One thing that has been ignored entirely in the procedures outlined under the CMS as a means of tackling iASM which has led to the pollution of water resources is the fact that CMS, like the ASM, assumes that all small-scale mining activities are carried out only on land, whereas in reality, mining activities that affect water bodies are already occurring. Although it is reasonable for the EPA and MINCOM to have standards in place to safeguard water bodies, it is important to acknowledge that mining activities that cause water pollution are already happening. The CMS scheme, based on the history of formalization of ASM and the fact that it does not provide a comprehensive upgrade on the requirement that tackles mining in rivers could be inefficient because even though it aims to engage community members in sustainable mining practices and preserve their resources, there is no guarantee that the buffer zones will not be breached and mining activities will not extend into water bodies, especially since there are mineral deposits in rivers. CMS operation is meant to be on land so the question still remains, what will happen with those mining in the river?

According to section 92 of Act 703, the CMS is required to be overseen by an oversight committee that is appointed by the Minister of Mines for a period of three years. This committee is made up of representatives from various organizations including the WRC, Forestry Commission, the District Police Commander, the Chief of the relevant community, and the Member of Parliament in the area. While this is a multi-stakeholder approach, it may reinforce the power structures and informalities as it has been before the implementation of CMS. The platform

for multi-stakeholder engagement does not translate to improvement in governance; it could also be a mechanism for reproducing power structures and suppressing other stakeholders' interests. They argue that a political-economy analysis of power and the allocation of rents should be conducted, and the risk of collusion between stakeholders should be investigated if a multi-stakeholder group can contribute to natural resource sector improvement.

First of all, these positions are usually filled by the ruling party in government, with the exception of the Chief. Both the minister and district-level leaders of the public service are appointed into office. Politicization of the public sector in Ghana is not a new phenomenon and several studies identify it as one of the primary causes of state exploitation and corruption. According to Ayee (2013), the constitutional and legal framework, as well as the culture of patronage, have made the politicization of public service a de facto norm. This could potentially set the tone for appointments of committee members affiliated with the ruling party, which could marginalize the traditional leader's influence in decision-making because they will hold the majority. Ayee argues further, based on his findings, that a non-politicized public service is no longer viable, which supports the argument by Mulgan (1998) that the primary function of a bureaucracy in a democracy is to implement the government's preferred policy.

This is particularly concerning given that the interests of the individuals in governance will prevail over those of the local people. As discussed in previous sections, there is a growing concern among the local folks that the interest of government actors, who are believed to be in favor of increasing iASM activities for personal gain, is at odds with those of locals, who wish to preserve the river. Throughout the interviews, most participants expressed their support for the creation of a collaborative platform but also voiced apprehension regarding the competing interests of the various stakeholder groups. Participants emphasized that a lack of clear articulation of interests related to the Ankobra river utilization could hinder the potential of sustainability initiatives. The community's trust in the traditional leaders has eroded because they believe they have been corrupted by the politics and benefits around the mining operations. This implies that the formation of the multi-stakeholder oversight committee aimed at promoting compliance and combating galamsey must involve a careful investigation of participants' interests, rather than simply relying on their social status or positions in society. It is crucial to ascertain that the individual participants are genuinely committed to the overarching public goal of ensuring sustainable utilization of natural resources, rather than pursuing personal or group interests.

The representatives of the government institutions at the local level have little influence on decisions that are made since they represent the interests of the leaders at the national level. This will mean that those representatives appointed to serve in the oversight committee will only be serving the interest of the negotiations done at the higher political offices. Their power to effect changes then is compromised by those in higher positions. The Chief also reflects the decisions of the local community whose interest is to restore the river because the impact the pollution has had on their livelihoods but is this the same interest as the Chief? The data from the interviews and discussions has shown that some Chiefs allegedly hold galamsey businesses as well, so are the community represented then?

To sum up, while the CMS aims to enable local communities to benefit sustainably from their resources and involve them in decision-making while preserving the environment, the policies' inherent limitations reinforce existing power structures within society that affected the effectiveness of small-scale mining formalization and legislation. In general, collaborative management approach as practiced currently, has the potential to address the issues of iASM and its related pollution in lower Ankobra but due to some of the power structures and informalities identified and explained in this study, it may not be effective as intended and could further lead to increased pollution and marginalization of local community concerns.

6.5 Conclusions and Recommendations for future research

The Adelekezo and Eziome communities along the Ankobra river have been significantly affected by the pollution resulting from illegal mining activities. The pollution has led to the degradation of the environment, the destruction of farmlands, and the contamination of water sources. These communities rely heavily on agriculture for their livelihoods, and the pollution has had a severe impact on their ability to sustain themselves. Despite the devastating effects of the pollution on the communities, the current political and regulatory systems have failed to address the issue effectively. The findings from the fieldwork indicate that political actors within government institutions and traditional leaders are powerful groups that wield significant influence in decision-making, frequently to the detriment of government institutions and other local stakeholders. The regulatory institutions at the regional and district levels are ineffective due to the influence of powerful political leaders in the central government. The traditional authorities who make decisions at the local level are also allegedly influenced by the same political leaders.

The fight against pollution in Adelekezo and Eziome is, therefore, not just about tackling pollution directly, but also about addressing the underlying structural power dynamics imbued in various social identities that give more legitimacy to some people than others. The constitution, federal bureaucracies, and informal norms and values are some of the significant structural preconditions that contribute to the problem. The newly introduced Community Mining Scheme (CMS) aimed at promoting collaboration among stakeholders and involving the community in sustainable mining. Unfortunately, it seems to follow the same ineffective pattern as the Integrated Water Management Plan and Small-scale mining under the Minerals and Mining Act of 2006. It reinforces the authority of political and traditional leaders in decision-making, could perpetuate informal practices in registration and licensing, and does not address mining activities in rivers as it only applies to land-based mining.

Considering these findings, policymakers and stakeholders must take a more holistic approach to addressing the pollution of the Ankobra river in the Adelekezo and Eziome communities. Such an approach must involve tackling corruption and informalities in the social system, ensuring effective political systems, and promoting transparency and accountability. Transparency, as suggested by Kolstad and Wiig (2009), effectively increases the expected costs of corruption, although its effectiveness is conditional on the presence of accountability and punishment mechanisms. The oversight committee of the CMS, which includes multiple

stakeholders, should make sure to identify each member's socio-political abilities and interests. Without offering incentives for good behavior and punishment for those who act against the common good, transparency cannot be achieved. As Olson cautioned, "rational self-interested individuals" will not work towards achieving their collective goals without clear accountability mechanisms (Olson, 1965). Over the years, it has been demonstrated that the government has been reluctant or slow to take legal action against political and government officials who have been implicated in corrupt activities and the misappropriation of public funds. This needs to be addressed before there can be effective accountability and transparency in the implementation of the CMS.

Moreover, the interests and voices of local community members must be adequately considered in decision-making process aimed at managing the Ankobra river and its resources. One option would be for the CMS multi-stakeholder oversight committee to include a representative chosen by the community members themselves, and given the legal authority to both reward and punish group members and individuals or organizations involved in small-scale mining activities within the committee and in general. The presence of such a representative alongside traditional rulers would enable greater community participation and provide an important check on the power dynamics within the group. It can also ensure transparency and information dissemination to the local communities.

In addition to the findings and recommendations provided in this study, there are several possible future research suggestions that could provide a more comprehensive understanding of the pollution of the Ankobra river in the Adelekezo and Eziome communities. Firstly, future research could focus on the potential health impacts of the polluted water on the residents of the affected communities. This could involve laboratory testing of the river water to determine the presence of toxic substances such as heavy metals and other contaminants that could be harmful to human health. Such research could provide valuable insights into the health risks faced by the residents and inform the development of targeted health interventions to mitigate these risks. The interdisciplinary approach by BC5 could potentially develop base research on harmful chemicals in the drinking water of the local residents to complement the findings of this study.

Secondly, Further research could explore feasible methods or a combination of methods that directly address illegal mining activities in water bodies. While collaborative management is essential for engaging stakeholders and encouraging community involvement, this study has

revealed that it may not directly address the galamsey operations in the rivers, which is the primary goal. Unlike collaborative approaches, repressive measures such as the ban on ASM and the use of military intervention to arrest and confiscate galamsey operations in the rivers have proven effective in preserving the rivers, as highlighted by research participants in this study. A comprehensive SWOT analysis of the opportunities and strengths of developing a multi-framework that includes policies from various approaches could yield a synthesis. For example, persuasive methods such as education and information dissemination could complement any approach and improve the long-term inclusion and participation of community members in policies.

Finally, it would be important to undertake research into the communities located upstream to contrast and compare the outcomes of the pollution's effects on local livelihoods and the governance systems held accountable for the sustained unlawful mining undertakings in the area. The results have demonstrated that the community members strongly believe the primary cause of the river's contamination emanates from the communities located upstream. Therefore, it would be valuable to explore the actions taken by the traditional leaders and government institutions in these areas, the strategies employed over time to curtail the mining activities, and the primary stakeholders involved in its perpetuation. This would enhance our understanding of the complex interplay of factors that underpin the persistence of these activities and inform potential policy interventions aimed at addressing the pollution along the Ankobra basin.

In conclusion, the pollution resulting from illegal mining activities has had a devastating effect on the Adelekezo and Eziome communities along the Ankobra river. Tackling the pollution requires a more holistic approach that involves addressing the underlying structural preconditions and capacities inherent social identities, promoting effective political systems, and ensuring transparency and accountability in the management of natural resources. It is essential that collaborative strategies aimed at managing the Ankobra river and its resources give due consideration to the interests and perspectives of local community members. This should go beyond just engaging them in dialogue and involve making them an integral part of the decision-making process, with legal backing to ensure their input is taken into account.

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APPENDICES

Appendix A: NSD Form

Are you interested in taking part in the research project “*(The role of Collaborative Management in dealing with Ankobra river pollution)*”?

This is an inquiry about participation in a research project where the main purpose is to offer a multi-stakeholder perspective that builds on community collaboration to reduce pollution and ensure sustainable management of the estuary. In this letter, we will give you information about the purpose of the project and what your participation will involve.

Purpose of the project

This is a master thesis project which focuses on the power dynamics at play among stakeholders responsible for the management of the Ankobra River. It investigates how a community-based management approach can potentially contribute to the restoration of the estuary from pollution.

Who is responsible for the research project?

Norwegian University of Science and Technology (NTNU) Department of Geography is the institution responsible for the project.

Why are you being asked to participate?

The research focuses on five main categories namely residents of Eziome and Adelekezo communities, the youth or workers in illegal mining, community leaders, district assembly representatives, and non-governmental organizations which will be randomly selected. You have been chosen because you fall under one of the categories mentioned above.

What does participation involve for you?

The methods for this study are semi-structured interviews and focus group discussions. The questions are about your thoughts and perceptions of how to sustainably manage the Ankobra estuary, the impact of the pollution on locally-based livelihoods, and the conflicts that are present among stakeholders involved in the utilization of the estuary.

For the interviews, you will be asked about your thoughts on illegal mining, the influence of government interventions on livelihoods, and the impact of pollution. In the focus group discussion, the representatives from these groups will be asked questions on their perceptions of the other stakeholders in the management of the estuary.

If you choose to participate in the project, you will be interviewed or subjected to a multi-stakeholder group discussion which will take approximately 45mins. I will take notes during these sessions and your answers will be recorded electronically.

Participation is voluntary

Participation in the project is voluntary. If you chose to participate, you can withdraw your consent at any time without giving a reason. All information about you will then be made anonymous. There will be no negative consequences for you if you chose not to participate or later decide to withdraw.

Your personal privacy – how we will store and use your personal data

We will only use your personal data for the purpose(s) specified in this information letter. We will process your personal data confidentially and in accordance with data protection legislation (the General Data Protection Regulation and Personal Data Act).

- This data will be available to me and my supervisor only
- I will replace your name and contact details with a code. Participants will not be recognized as they will be anonymized.

What will happen to your personal data at the end of the research project?

The project is scheduled to end in June 2023. The data will be deleted after the project is completed and will not be stored for any purpose.

Your rights

So long as you can be identified in the collected data, you have the right to:

- access the personal data that is being processed about you
- request that your personal data is deleted
- request that incorrect personal data about you is corrected/rectified
- receive a copy of your personal data (data portability), and
- send a complaint to the Data Protection Officer or The Norwegian Data Protection Authority regarding the processing of your personal data

What gives us the right to process your personal data?

We will process your personal data based on your consent.

Based on an agreement with Norwegian University of Science and Technology, NSD – The Norwegian Centre for Research Data AS has assessed that the processing of personal data in this project is in accordance with data protection legislation.

Where can I find out more?

If you have questions about the project, or want to exercise your rights, contact:

- Norwegian University of Science and technology (NTNU) via Dr. Elizabeth Barron, phone number +4773591963
- NSD – The Norwegian Centre for Research Data AS, by email: (personvertjenester@nsd.no) or by telephone: +47 55 58 21 17.

Yours sincerely,

Benjamin Boateng

Project Leader
(Researcher/supervisor)

Student (if applicable)

Consent form

I have received and understood information about the project [*The role of Community-based management in dealing with Ankobra river pollution*] and have been given the opportunity to ask questions. I give consent:

- to participate in *the interview*
- to participate in *the focus group discussion*
- for my personal data to be processed outside the EU – if applicable
- for information about me/myself to be published in a way that I can be recognized (describe in more detail)– if applicable
- for my personal data to be stored after the end of the project for (insert purpose of storage e.g. follow-up studies) – if applicable

I give consent for my personal data to be processed until the end date of the project, approx. [insert date]

(Signed by participant, date)

Appendix B: INTERVIEW GUIDE

Instruction

Please tick [√] only the box of the response given/state briefly for an unprovided item.

SECTION A

DEMOGRAPHICS OF RESPONDENTS

1. What is your gender: Male Female Other
2. What is your age: 18-30 31-40 41-60 61 and above
3. What is your marital status: Married Single Divorced
4. What is your household size: 1-5 6-10 11-15 16 and above
5. What is your level of education: Basic Secondary Degree/Diploma Post Graduate
6. What is your current occupation?.....
7. How long have you lived in the community: 0-5 years 6-10 years Above 10 years

SECTION B

PERCEPTIONS ON IMPACT OF POLLUTION ON LIVELIHOOD

1. In your opinion, what do you think is the cause of pollution of the river?
2. Can you tell me your opinion on mining in this community?
3. What were some of the benefits of the estuary before the pollution to you?
 - 3b. Do you still have it now?
4. In your opinion, do you think illegal mining has any impact on the underlisted?
 - Economic activities

- Fish stock
- Agricultural activities

4b. If yes, can you tell me some of the impacts?

5. Do you think the ban on galamsey reduced pollution of the estuary in your community?
6. In your opinion, what do you suggest to be done to prevent the pollution downstream of the Estuary?

SECTION C

PERCEPTIONS ON THE MANAGEMENT OF THE ANKOBRA ESTUARY

7. Who do you think is responsible for managing the Ankobra river?
8. Do you think you have a role to play in managing the river? Why?
9. Do you think the opinions of the local people are taken into consideration in managing the Ankobra river in your community?

SECTION D

PERCEPTIONS ON COMMUNITY BASED MANAGEMENT

10. Have you heard of community-based management of natural resources? Yes or No
11. If Yes, can you tell me what you know about it?
12. Do you think Collaborative management can prevent the pollution of the estuary due to illegal mining? Yes or No
13. Explain your answer

Thank you

Appendix C: FOCUS GROUP QUESTIONS

ROLE OF COLLABORATIVE MANAGEMENT IN DEALING WITH ANKOBRA RIVER POLLUTION

Name of Community:

Name of Group representing:

Section A: Management Practices

Identify main stakeholders and their interest in the management of the Ankobra Estuary.

1. How is the Ankobra estuary and associated natural resources managed by surrounding communities?
2. In your opinion, what are the roles of government, traditional leaders, and local associations and residents in managing the estuary?
3. What are the conflicts surrounding the management of the estuary by different stakeholders? Identify active sources of disputes and describe their main elements
4. What are the current management strategies of the Ankobra Estuary?

Section B: Perceptions of stakeholders

1. Who do you think is responsible for the management of Ankobra Estuary?
2. What is your perception of illegal mining (galamsey) and pollution of the Ankobra Estuary?
3. How will you protect the resource to ensure sustainability?

Section C: Perceptions on Collaborative management

1. What is your idea on community-based management of natural resources?
2. Is it necessary/applicable to co-manage the Ankobra resource between various stakeholders in the community? Why?
3. What do you think are the main obstacles to community-based management of the estuary in the community?

Appendix D: PICTURES FROM FIELDWORK



A) Open-Galamsey site in Adelekezo Community



B) State of Ankobra river during fieldwork



C) Researcher having a discussion with a local resident in Eziome



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