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Managers' Challenges Complying With Environmental Regulations in Ghana's Mining Sector

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Abstract

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MPA, Keller Graduate School of Management, DeVry University, 2015

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Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy PPA – Health Policy

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Abstract

Even though Ghana's mining industry has been and continues to be of remarkable benefit to the national economy, environmental pollution continues to plague the industry. The purpose of the qualitative case study was to obtain the perceptions of 9 nongovernmental organization (NGO) stakeholders of the challenges faced by managers in the Ghanaian mining industry tasked with complying with Ghana Environmental Protection Agency (GEPA) regulations. Freeman's stakeholder theory was the theoretical framework of the study. Data were collected from semistructured interviews with a purposive sample of Ghanaian and international NGO representatives who sought to work with, or even shame and pressure, mining companies to adhere to Ghanaian and international environmental standards to reduce pollution. The transcriptions were then analyzed using NVivo and coded to generate themes. The research question sought to discover ways that GEPA compliance by the mining sector could be improved. Four major themes emerged from the study: (a) NGO role as advisor limited the ability of NGOs to help mine managers to comply with GEPA; (b) a small, tight-knit community of government officials and senior mine managers created conflicts of interest; (c) investment in mining companies; and (d) actual actions by NGOs. The significance of the study is that it undertook a thorough and broad investigation into the environmental and health impacts of the mining sector on Ghanaian communities. This study has implications for social change by providing insight into the need to adopt best practices to improve GEPA compliance by the mining sector and decrease environmental pollution.

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Dedication

This dissertation is dedicated to the memory of beloved parents, Francis Koloko Tandoh and Agnes Manzachie Koffie. My father passed away before I started my doctoral studies, and my mother passed away in the middle of my doctoral studies. I was still in senior high school when my father passed away prematurely 5 decades ago. My young mother worked hard to care of my siblings as well as my schooling all by herself. Without her extraordinary personal sacrifice, support, and unconditional affection, my siblings and I would have never become the individuals that we are today. I vowed to make my parents proud by achieving this monumental academic goal, and I hope that I have fulfilled that promise. I wish that my parents were alive to celebrate with us my completion of this doctor of philosophy degree.

I also dedicate this work and offer my deepest gratitude to Paulina Anapo Tandoh, my wonderful wife; Jasmine Agnes Manzachie Tandoh, my beautiful daughter; and my amazing sons, James Ransford Tandoh and Joshua Ewiah Tandoh, for being there and supporting me throughout the entire doctoral program. All of you have been my greatest cheerleaders.

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I also extend my heartfelt thanks to Barb Elwert, who served as my editor and provided guidance throughout the entire dissertation process, and to all of the friends who remembered me in their prayers and gave me hope that I would complete this dissertation journey.

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Chapter 1: Introduction to the Study

Introduction

The mining industry has contributed heavily to the economy of Ghana. Gold mining is among the most widely practiced forms of mining in Ghana (Aragon & Rud, 2015). From artisanal mines to large-scale mining operations, people have operated mines in the country for years. These mining operations have increased over the past few decades, with more recent rapid expansion of mining operations in the country (Snapir, Simms, & Waine, 2017).

Despite the economic benefits of mining, these operations have come at a cost to the local environment. Ghana has suffered as pollution has filtered into the environment, having a negative impact on land, air, and water (Amponsah-Tawiah & Mensah, 2016). Efforts to curb this pollution through regulations were undertaken by the Ghana Environmental Protection Agency (GEPA; Macdonald, Lund, Blanchette, & Mccullough, 2014). Despite the GEPA regulations being well known, an estimated 75% of Ghanaian mining companies were in violation of significant provisions (Snapir et al., 2017).

Environmental regulations and monitoring efforts represent a significant effort to curb mining pollution in Ghana. However, there has been little research on the reasons mining managers have failed to implement GEPA regulations. This study explored the challenges that managers faced when attempting to ensure compliance of mining organizations with GEPA rules. The results of the study will contribute to the literature regarding the enforcement of GEPA regulations, and they also may help to inform future policies and support the efforts of mining managers to implement GEPA regulations.

Presented in Chapter 1 is information about the background of the problem, an overview of the theoretical framework, a review of the nature and key variables of the study, and the limitations and delimitations of the study. The chapter concludes with a summary.

Background

Research on the detrimental environmental impact of the Ghanaian mining industry has suggested that the challenges of mining companies to comply with GEPA regulations have resulted in substantial toxic pollution to Ghana's air and water (Bai, Kusi-Sarpong, & Sarkis, 2017; Bortey-Sam et al., 2015). Toxins have entered the Ghanaian food chain directly and indirectly through chickens, livestock, and crops. Chicken gizzards and livers specifically have been connected to toxic metal exposure in children and adults. Children were found to be at particular risk because they were the most likely to suffer from acute, subacute, and chronic effects related to ingesting pollutants (Bortey-Sam et al., 2015).

The risk to human health has been manifested not only among residents of the region but also among mineworkers (Obiri et al., 2016). A human health risk assessment of artisanal miners was conducted in the Prestea-Huni Valley District of Ghana using U.S. GEPA risk assessment guidelines. Water and sediment samples were collected from the region. Obiri et al. (2016) found that miners were at elevated risk of developing cancer and noncancerous diseases because of this exposure. Jonah, Adams, Aheto, Jonah, and Mensah (2017) described the important role played by managers to effect change from with Ghanaian mining companies to comply with GEPA regulations.

Investigations into the environmental and health impacts of the mining sector in Ghana found mining operations to be more hazardous than beneficial to the daily lives of 40% of the Ghanaian population and the economic development of the country (Bansah, Yalley, & Dumakor-Dupey, 2016; Tucker, 2015). Accordingly, 75% of Ghanaian mining companies claimed to have responded to pollution concerns by following GEPA regulations to ensure environmental sustainability and mitigate the damage caused by previous pollution (Bawua & Owusu, 2018). Whether some of these measures can reduce or minimize the negative health impacts of mining on the environment and surrounding communities in Ghana has been a matter of great concern (Amponsah-Tawiah & Dartey-Baah, 2014)

Problem Statement

There has been a lack of research about poor mining GEPA compliance and ways that GEPA compliance can be improved in the mining sector. Water, air, and soil pollution have led to health problems for 70% of the Ghanaian residents living in mining regions (Mensah et al., 2015), and mining pollution has affected the daily lives of 40% of the general population (Basu, Clarke, et al., 2015). Ghanaian mining activity is one of the predominant causes of pollution, releasing poisonous chemicals into rivers and making water unsafe for direct human use (Mensah et al., 2015). The managers hired by mining companies are responsible for ensuring compliance with GEPA regulations by administering the work process and reporting incidents to senior management (Martyka, 2014). The mine managers also are responsible for implementing mining companies'

strategies and communicating GEPA rules and policies to employees (Jaroslawska-Sobor, 2016).

Macdonald et al. (2014) conducted a survey of 200 managers in the Ghanaian mining industry and found that 75% had failed to comply with GEPA requirements. Although 25% of managers have been successful in ensuring the compliance of mining companies with GEPA regulations, very little research has been conducted on the factors affecting compliance of mining companies with GEPA regulations (Bansah et al., 2016). Ahorbo (2014) highlighted the need for research regarding Ghanaian mine managers to provide additional insight into compliance with GEPA regulations in the Ghanaian mining sector. The Ghanaian mining sector accounts for approximately 5.7% of the country's gross domestic product, and 85% of the Ghanaian population have voiced concerns about the environmental and health effects of mining operations (Bawua & Owusu, 2018; Mensah et al., 2015).

In Ghana, pollution resulting from the dumping of hazardous chemicals into waterways resulting from mining activities has meant the release of gases into the environment and the destruction of the natural topography, affecting 54% of the Ghanaian population (Bansah et al., 2016). Challenges remain to meet GEPA regulations, and despite legal sanctions, some companies have continued to operate mines in noncompliance of GEPA regulations (Adonteng-Kissi & Adonteng-Kissi, 2017).

Purpose of the Study

The purpose of the study was to obtain the perceptions of nongovernmental organization (NGO) stakeholders of the challenges faced by managers in the Ghanaian

mining industry tasked with GEPA compliance. The researcher focused on exploring the NGO stakeholders' perceptions of the challenges that mine managers faced when attempting to ensure compliance with GEPA regulations. The study will advance knowledge about managers in the Ghanaian mining industry tasked with ensuring compliance with GEPA regulations.

Research Question

The study was guided by one research question (RQ): What are the perceptions of NGO stakeholders of the challenges faced by managers tasked with GEPA compliance in the Ghanaian mining industry?

Theoretical Framework

Stakeholder theory, as developed by Freeman, Hörisch, and Schaltegger (2014) served as the theoretical framework to examine the challenges facing managers tasked with GEPA compliance in the Ghanaian mining industry Freeman et al. defined stakeholders as groups that support organizations that otherwise would cease to exist without such support. Stakeholders include customers, employees, suppliers, political action groups, environmental groups, local communities, the media, financial institutions, governmental groups, and the broader international community. Stakeholder theory posits that corporations exist in an ecosystem of related stakeholders and that the costs and benefits to each group must be weighed to keep the companies successful and the planet healthy.

Stakeholder theory is a useful framework that has been used in earlier research to model relationships among mining multinational enterprises (MNEs) operating in Ghana,

artisanal miners, and local actors in host countries, and the theory also has been widely used to develop corporate social responsibility (CSR) programs (Yakovleva & Vazquez-Brust, 2018).

Stakeholder theory suggests that MNEs have a stake in promoting constructive dialogue with Ghanaian stakeholders on issues of mutual concern and sustainable mine management (Ali, 2017). Including local stakeholder interests in the decision-making process contributes to sustainability in emerging markets, future environmental liability, and the development of CSR programs. In the stakeholder theory model, mining managers implement fair procedures regarding land access, acquisition, relocation, and compensation with local communities and indigenous peoples. Stakeholder theory describes and predicts mining managers' behaviors in terms of the ways that the managers assign priorities to various stakeholders and weigh competing claims.

Nature of the Study

The nature of the study was a qualitative case study, an approach that was appropriate for this exploratory study (Smith, 2015). The case study approach is appropriate to investigate phenomena best addressed by "how" and "why" RQs (Savin-Baden, & Major, 2013). For the current study, the phenomenon under investigation focused on the challenges facing mining managers responsible for ensuring GEPA compliance in Ghana. Purposive sampling was used to recruit nine individuals employed by NGOs focused on Ghanaian mining interests. The qualitative case study involved collecting data from semistructured interviews, taking field notes, and reviewing documents (Yin, 2018). The case study approach was followed to conduct an in-depth

exploration of the perceptions of nine NGO employees involved in GEPA regulatory noncompliance issues (Stake, 2005). Data were collected from semistructured interviews with Ghanaian and international NGO representatives who sought to work with, or even shame and pressure, mining companies to adhere to Ghanaian and international environmental standards to reduce pollution (Yakovleva & Vazquez-Brust, 2018). Case studies rely on triangulation to reach data saturation and richly textured data sets, combined with content analysis, to develop themes. The researcher employed content analysis to identify recurring themes, ideas, and phrases.

Keeping the focus on how the NGO stakeholders encouraged mining managers' adherence to GEPA compliance was consistent with Freeman et al.'s (2014) stakeholder theory to understand Ghanaian mine managers' behaviors and challenges. The qualitative analysis helped to identify the experiences and ability of the participants to provide insight into management in the mining sector in Ghana to understand the need to comply with the GEPA's environmental regulatory policies (Mensah, 2015). The interview questions were derived from the stakeholder theory. The NGO stakeholders were asked to relate their training experience, or lack thereof, to determine how the mining operations would meet the environmental regulation requirements. They worked to motivate GEPA compliance. Other interview questions sought the Ghanaian NGO stakeholders' perceptions of the challenges facing mining managers to comply with GEPA regulations.

Definitions

Managers: Managers are individuals serving as supervisors and tasked with GEPA compliance (Ahorbo, 2014).

GEPA compliance. GEPA compliance refers to mining companies' adherence to regulations established by the GEPA by the Ghanaian EPA (Jaroslawska-Sobor, 2016).

Ghana Environmental Protection Agency regulations (GEPA): GEPA regulations ensure that mining companies protect the environment during operations (Jaroslawska-Sobor, 2016).

Assumptions

The researcher assumed that all answers given by the respondents to the interview questions were honest. The participants in qualitative studies sometimes believe that they must respond in ways that they feel the researchers want them to respond. It is the responsibility of researchers to ensure that study participants provide honest and unbiased responses.

Scope and Delimitations

The scope of this study included only NGO stakeholders. Although Ghanaian mining managers might have been able to provide more information regarding challenges to comply with GEPA regulations, consideration of such an inquiry was dismissed because of ethical concerns. The study was restricted to mining companies operating in Ghana only.

Limitations

One limitation of the research was the potential for participants to answer in ways that they believed the researcher wanted them to respond. This form of researcher-oriented bias could have meant false responses that were an inaccurate representation of the participants' lived experiences. To reduce the chance for bias, the role of the researcher was minimized. Participants were assured of the anonymity of their responses and were allowed to share their responses without much interference from the researcher. Instead, the researcher provided only a minimum of guidance when additional clarification about certain questions and topics was required.

Small sample sizes also may limit the generalizability of research findings. However, qualitative studies generate a large amount of information from small samples. In addition, having a larger sample would have exceeded the resources of the researcher. Although the generalizability of the findings may be limited, the resulting qualitative data may form the basis of larger quantitative studies.

Significance

The study focused on the challenges facing Ghanaian mine managers in their efforts to comply with GEPA regulations. The significance of the study is that it sought to investigate the environmental and health impacts of the mining sector on Ghanaian communities (Basu, Phipps, Long, Essegbey, & Basu, 2015). The results and recommendations of this study will serve as a guide in providing insight into ways that managers could comply with GEPA regulations and standards (Ahorbo, 2014).

Success in the Ghanaian mining industry is based on consistent adherence to GEPA regulations (Jaroslawska-Sobor, 2016). Results of the study may help mining companies and businesses to understand the need to follow environmental compliance practices (Basu, Phipps, et al., 2015). The implications for social change are that business practices will improve once employees are willing to comply with GEPA standards and regulations through the increased involvement of management (Ahorbo, 2014). According to Andrews (2016), improved compliance will lead to social change and reduce environmental pollution. The social change implications are that if core business practices improve in the mining sector in Ghana, then decreases in the levels of environmental pollution might be realized (Andrews, 2016).

Summary

The Ghanaian mining industry contributes heavily to the country's economy and the livelihoods of residents. However, mining poses a continuous threat to the environment. The process of extracting and refining has the potential to pollute the land, air, and water. This level of pollution could have significant consequences not only for the environment but also human health. NGO stakeholders have significant knowledge of the challenges facing Ghanaian managers in their efforts to comply with GEPA regulations.

Results of the study will advance knowledge of the challenges facing managers in the Ghanaian mining industry when attempting to ensure compliance with GEPA standards. The study has significance for Ghanaian mining companies by providing a better understanding of what discourages adherence to GEPA regulations. By having a

clearer understanding of these challenges, it may be possible for the mining industry to make adjustments that help to ensure greater compliance and reduce negative environmental and health impacts.

Encouraging adherence to GEPA regulations by mining managers may play a role in reducing Ghanaian pollution; however, more information about how to do so was required. This qualitative study examined the experiences of NGO stakeholders with Ghanaian mining managers to understand the challenges facing the managers in ensuring compliance with GEPA regulations. Data were drawn specifically from NGO stakeholders focused on the Ghanaian mining industry. Included in Chapter 2 is an examination of mining in Ghana, including the impact of pollution on the environment and human health. Issues in the management of Ghanaian mining companies and ensuring compliance also are explored.

Chapter 2: Literature Review

Introduction

The Ghanaian population is heavily impacted by pollution of air, water, and land (Amponsah-Tawiah & Mensah, 2016). Mining is one of the primary sources of this pollution because it releases poisonous chemicals into the environment. Mine managers are responsible for ensuring that mining companies ensure compliance with the GEPA. This compliance requires that environmental regulations be adhered to and that violations are reported. However, up to 75% of these managers have failed to adhere appropriately to GEPA requirements (Macdonald et al., 2014).

Despite the low level of compliance, there has been little research into what factors may ensure that mining companies comply with GEPA regulations (Bansah et al., 2016). There has been an urgent need for research into compliance. Bansah et al. (2016), for example, noted that mining operations have been more hazardous than beneficial for much of the population in Ghana, but whether the actions that these companies have taken have minimized negative health consequences for locals have not been determined (Amponsah-Tawiah & Mensah, 2016). Ahorbo (2014) noted that phenomenological research into the experiences of NGOs with mining managers could provide insight into what supports compliance in the Ghanaian mining sector.

Results of the current study will help to understand the challenges facing managers when attempting to ensure compliance with GEPA standards in the Ghanaian mining industry. The study will have significance for Ghanaian mining companies by helping them to understand the factors that have discouraged adherence to GEPA

regulations. By understanding the challenges with compliance, it may be possible to make adjustments in the mining industry to ensure greater compliance and reduce negative environmental and health impacts. The recommendations of this study will support compliance with GEPA standards. Chapter 2 includes a review and synthesis of existing literature on the Ghanaian mining industry and a discussion of the managerial challenges trying to comply with the environmental regulations set by GEPA. Also included in the chapter are an explanation of the literature search strategy and an overview of the theoretical foundation of the study. The chapter closes with a summary and a conclusion.

Literature Search Strategy

Literature related to key variables was searched using several online databases: Emerald Insight, Google Scholar, ScienceDirect, Semantic Scholar, Springer Link, and Wiley Online Library. The Google search engine was used in all cases except when specific proprietary search engines and databases were required. The following phrasing was used to search for key terms: *GEPA mining regulations*, *GEPA mining regulations in Ghana*, *Ghana mining*, *managers in Ghana mining*, and *GEPA compliance in Ghana mining*.

The literature review was conducted by drawing upon peer-reviewed journal articles as well as books and dissertations. The period under review spanned 2014 to 2018. An exception to this time range was made when foundational research establishing the basis for the framework from before the primary research period was reviewed. The research sources retained for inclusion in the study were specific to environmental

regulations in the Ghanaian mining industry and the difficulties faced by managers in ensuring compliance. Of the research articles reviewed, 80% were quantitative in nature, and 20% qualitative in nature. Of the 130 works that were reviewed, 80 were identified for inclusion in the study.

The need for research into the Ghanaian mining industry and the challenges facing managers in their efforts to comply with GEPA regulations was the result of questions regarding the ability of the managers to actually ensure compliance (Macdonald et al., 2014). Given the level of damage that environmental pollution can have on human health, studies on this topic may help to reduce the negative impact on human lives. The literature review is organized in the following ways. First, the theoretical foundation of the study is established. Second, literature regarding GEPA mining standards in Ghana and the challenges faced by managers is reviewed. Finally, a summary and a conclusion to the literature review are provided.

Theoretical Foundation

Stakeholder theory, as developed by Freeman et al. (2014), served as the theoretical framework of this study on the challenges facing Ghanaian managers tasked with GEPA compliance in the Ghanaian mining industry. Stakeholders may refer to customers, employees, suppliers, political action groups, environmental groups, local communities, the media, financial institutions, governmental groups, and the broader international community. Stakeholder theory is a useful framework that has been employed in earlier research to model relationships among MNEs operating in Ghana,

artisanal miners, and local actors in host countries. The theory has been widely used to develop CSR programs (Yakovleva & Vazquez-Brust, 2018).

Stakeholder theory posits that corporations exist in an ecosystem of related stakeholders and that the costs and benefits to each group must be weighed to keep companies successful and the planet healthy. Stakeholder theory suggests that mining companies must recognize that they have a vested interest in promoting constructive dialogue on issues of mutual concern and sustainable mine management (Ali, 2017). Including local stakeholder interests in the decision-making process contributes to sustainability in emerging markets, future environmental liability, and the development of CSR programs. In the stakeholder theory model, mining managers implement fair procedures regarding land access, acquisition, relocation, and compensation with local communities and indigenous peoples. Stakeholder theory describes and predicts mining managers' behaviors in terms of the ways that the managers assign priorities to various stakeholders and weigh competing claims.

Core, or salient, stakeholders manifest legitimacy, power, and urgency of claims (Yakovleva & Vazquez-Brust, 2018). Conversely, fringe stakeholders lack one or more of these attributes, and they have no access to decision making. Fringe stakeholders include the marginalized poor as well as disinterested, divergent, isolated, weak, or illiterate parties. Power refers to the ability to influence another social actor to do something that would not have otherwise happened. Coercive, utilitarian, or normative types of power may flow from formal, political, economic, and relational sources (Ali, 2017).

Legitimacy refers to "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs and definitions" (Suchman, 1995, p. 574). Legitimacy relates to self-interest, benefit, exchange, and influence (Ali, 2017). Stakeholder legitimacy is a social process codetermined by mining managers; owners; and other stakeholders, especially the government. Actors without legal legitimacy or groups engaging in illegal activities are not considered stakeholders.

Urgency is the degree to which stakeholder claims call for immediate attention (Suchman, 1995). Urgency comprises time sensitivity and criticality. Urgency is increased by the frequency of interactions between two parties and is the strongest predictor of salience. Salience perceptions are dynamic, meaning that managers can prioritize and deprioritize stakeholder status over time (Yakovleva & Vazquez-Brust, 2018). Stakeholders gain salience by accumulating resources that increase their size, developing unique capabilities and advantages through coalition building, or adding value to critical processes. Illegal entities may acquire legitimacy over time, such as the emancipatory movements fighting colonial powers who were once considered terrorists (Ali, 2017). Stakeholder theory was an appropriate choice as the theoretical framework of the study because of the wide variety of parties with vested interests in Ghanaian environmental stewardship, including citizens of Ghana, citizens of the world, Ghanaian government officials, and NGOs charged with influencing compliance of the mining industry with GEPA regulations.

Literature Review Related to Key Variables

Ghanaian Mining Regulations

In Ghana, the Minerals Commission (2018) plays an important role in regard to the mining and use of precious minerals. The vision established by the Commission is to make Ghana a primary destination for the mining sector within the continent of Africa through the creation of an operational atmosphere in which multiple stakeholders can work toward the nation's sustainable development through the mining industry. The Minerals Commission (2018), which is the regulatory body for the mineral sector in Ghana, not only manages the utilization of minerals in Ghana but also coordinates and implements mining policies inside the country.

National law assigns several important duties to the Minerals Commission (2018): (a) formulating policies for exploring and exploiting minerals, (b) developing recommendations for the minister of lands and natural resources, (c) monitoring and implementing policies regarding minerals and monitoring bodies responsible for minerals, and (d) collecting data on minerals as well as the exploration and exploitation of those minerals. Though the Mineral Commission can fulfill other functions, the duties that it has now are primarily related to dealing with precious minerals inside Ghana.

Multiple policy initiative have been created in the Ghanaian mining industry (United Nations, 2019). These policies were designed to address multiple aspects of the industry. Ideally, mining should be handled in such a way that it is socially and environmentally sustainable while also economically profitable. Mining should balance

the extraction of minerals against caring for human health and the security of the environment.

These policies also were designed around encouraging participation from the private sector in the exploration and exploitation of precious minerals in Ghana. To encourage more participation from the private sector, Ghana has attempted to create a working environment that makes the country attractive to mining investments while also developing regulations that facilitate transparency and equitable treatment toward investors (United Nations, 2019).

Previously, Law PNDCL 153 governed minerals and mining; however, Act 703 (United Nations, 2019) replaced it. Act 703 specifies that all minerals are entrusted to the president and his minister of lands and natural resources, who have oversight of minerals rights within the country. The same act specifies that all investors must be treated equally under the law, that written reasons for grant application approval and denials must be given, and that the Minerals Commission must make recommendations to the minister regarding the granting of mineral rights (United Nations, 2019). These are but a few of the ways that Act 703 governs minerals and mining rights in Ghana.

EPA Mining Standards in Ghana

The GEPA exists to protect and improve the country's environment (Environmental Protection Agency, Ghana, 2018). The agency tries to restrict pollution of the air, land, and water, and works with businesses across Ghana to fulfill this mission. The agency normally inspects and regulates businesses to ensure compliance with

regulations, and it responds to environmental emergencies. The GEPA was established in 1994 and was formed out of the previously existing Environmental Protection Council.

For businesses to conduct reconnaissance and exploration, or to start mining, they must obtain an environmental permit (Mensah et al., 2015). Mine managers are required to comply with Law L.I. 2182, which governs the locations of tailings and waste product storage facilities. The law also governs the process by which mines close and the long-term stability of storage of waste. Plants are required to have reclamation plans in place. Prior to the closure of any mine sites, the chief inspector of mines must confirm that sources of pollution have been stabilized for the long term. Closed mines cannot discharge pollution into the water, air, or soil.

In addition, zoning restrictions determine where mines can develop, and areas considered sacred are off limits to development. Unless granted special permission, mining operations also cannot operate within 100 meters of rivers, streams, reservoirs, dams, public roads, railways, buildings, forests, and reserves. There also are prohibitions on building in areas near markets, cemeteries, burial grounds, towns, villages, and government offices (Mensah et al., 2015).

Environmental laws and regulations pertaining to mining operations are substantial in Ghana (Mensah et al., 2015). Fuel, oil, and chemical containers must be maintained in good condition to avoid spillages and environmental contamination. There should be no leakages from equipment. Tailings used to fill worked areas underground and the liquid that drained because of tailing must meet the limits set by the GEPA. Stagnant water must be drained immediately, and when it forms, precautions must be

taken to prevent noxious gases from coming from that water. Specific to small-scale mines, mines managers need to ensure that the land is rehabilitated and revegetated when mining operations have ceased. Emergency spillways need to lead spillage into emergency ponds, where the overflow can be treated before being released into the environment (Mensah et al., 2015). Spilled fuels also need to be reclaimed and disposed of in ways that do not harm the environment.

Ghana also developed a general environmental action plan that it began adhering to in the early 1980s (Stockholm Convention, 2008). This plan recommended actions and activities that would make Ghana's development occur in sustainable ways. The plan applied not only to mining but also other areas of environmental sensitivity such as land management and coastal systems. The goal of the action plan was to help to maintain the country's ecosystem.

The action plan was not a law in itself, but it did help to set a policy framework coordinated by the GEPA to ensure the sound management of chemicals. Departments coordinating with the GEPA in the management process ranged from the Food and Drugs Board to the Ghana Atomic Energy Commission and Ministry of Health. Each department took on various roles, including the development of policies, conducting research, and enforcing regulatory requirements (Stockholm Convention, 2008).

Ghanaian Mining Industry

Gold mining is among the most common mining activities in Ghana (Aragon & Rud, 2015). Gold mining in Ghana is conducted mostly in large-scale mines that are highly modernized and employ heavy mechanization. The mining activities also create air

as well as water pollution in particular. These mines boast power plants and drive road traffic that contributes to air pollution. Gold mining in Ghana has been a significant driver of the socioeconomic and political lives of residents for thousands of years (Obiri et al., 2016). However, different challenges are facing different sectors of the industry. Artisanal miners are distinct from those working for larger corporations, so there are human health hazards associated with people of all backgrounds living and working near the mines operating in Ghana.

The mining industry has had a variety of outcomes for Ghana (Cobbinah & Amoako, 2018). Cobbinah and Amoako (2018) explored the effect of mining activity on towns in Ghana by attempting to understand the history of mining activity, examining the legal environment surrounding mining activity, and the outcomes for Ghanaian urban planning. Data were drawn from documents concerning the development of mining towns. Following their review, Cobbinah and Amoako concluded that mining had dual outcomes, sometimes encouraging the growth of some communities while causing others to stagnate. In some cases, mining towns collapsed entirely after a period of economic downturn (Cobbinah & Amoako, 2018). These mining communities also altered the local economies and had a negative impact when they closed. Investment in these mining communities encouraged investment in the creation of temporary mining settlements but also forced the resettlement of communities as a consequence of harmful mining practices (Cobbinah & Amoako, 2018). The results showed that mining activities could have a lasting and potentially negative, disruptive impact on communities because of mining practices.

Snapir et al. (2017), who noted the rapid expansion of gold mining efforts in Ghana, studied the expansion of Galamsey gold mines in the coco-growing region of Ghana. Galamsey refers to artisanal gold mining that occurs throughout Ghana. Exploration of the cocoa-growing area was conducted using optical remote sensing to better understand how the growth of artisanal gold mines was affecting the area (Snapir et al., 2017). Snapir et al. found that between 2011 and 2015, the number of Galamsey gold mines had tripled from 10,907 to 36,696. This rapid growth began to encroach on areas traditionally reserved for the production of cocoa. In addition, the mining efforts along a major river network in the area led to increased downstream pollution that affected the riverways and soil (Snapir et al., 2017). The results indicated that artisanal gold mining was expanding rapidly and was having a significant negative impact on the local ecology.

Bansah, Dumakor-Dupey, Kansake, Assan, and Bekui (2018) also studied artisanal mining to find out what the impact of these mines was. Bansah, Dumakor-Dupey, Kansake, et al. noted that artisanal mines had socioeconomic and environmental impacts on the surrounding areas. Using a case study to examine a community affected by an artisanal mine in the western region of Ghana, the researchers collected data informed by literature reviews, interviews, questionnaires, and water quality assessments. Bansah, Dumakor-Dupey, Kansake, et al. concluded that the artisanal mine was associated with a number of negative outcomes in the area. For example, despite supporting the livelihoods of people living in a region with few employment alternatives, the small-scale mine also promoted truancy, adolescent pregnancy, child labor, and environmental degradation. The area's water quality also was negatively impacted by

manganese and iron, leading to contamination of the water that was 500% above acceptable limits (Bansah, Dumakor-Dupey, Kansake, et al., 2018). Despite the livelihoods that artisanal mines could provide, the mines also have been complicit in several severely negative outcomes.

Mining plays an important role in the livelihoods of individuals throughout Ghana. Gold mining is the most common mining activity in the country (Aragon & Rud, 2015), and it has been responsible for driving economic growth. However, mining has been separated into artisanal, small-scale, and large-scale operations, each with its own challenges. Mining has had various impacts on the residents of Ghana, sometimes encouraging the development of communities while at other times leading to their dissolution (Cobbinah & Amoako, 2018). Small artisanal mining efforts are separate from larger operations, and even though they have helped to sustain livelihoods, they also have threatened other practices, such as the production of cocoa (Snapir et al., 2017).

The practice of mining is not a recent phenomenon; rather, it has affected Ghanaian lives for thousands of years. However, even small artisanal mining efforts have resulted in negative outcomes for the country's environment. It is important to acknowledge the important role of mining in society while addressing efforts and policies that protect the environment. The fact that mining plays such a large role in the livelihoods of so many people in Ghana highlighted the importance of developing and enforcing policies to local residents while also safeguarding the environment.

Environmental Impact

Residents living near gold mines saw a reduction in total agricultural productivity of nearly 40% between 1997 and 2005 when compared to those living further away from mines (Aragon & Rud, 2015). Although Aragon and Rud (2015) did not find evidence that agriculture productivity was impacted by the reallocation of labor, they did find higher amounts of air pollutants and increased rural poverty in communities living close to gold mines. An increase of one standard deviation in gold production was accompanied by a 10% decline in agricultural productivity for up to 12.4 miles surrounding the mine (Aragon & Rud, 2015).

Having appropriate regulations may help to reduce the concentration of toxins in the environment, as demonstrated by the reduction of mercury from one area of gold mining in Ghana (Hogarh, Adu-Gyamfi, Nukpezah, Akoto, & Adu-Kumi, 2016). Sediment core analysis conducted around Bibiani, a longtime location of gold mining in the region, revealed a marginal decline in mercury concentrations. This decline occurred over a 2-decade period between 1990 and 2010 following new policies restricting the use of mercury in Ghanaian mines. The continued use of mercury was ongoing in smaller illicit mines. Despite the reduction in mercury concentrations following implementation of new policies, Hogarth et al. (2016) noted that data from the area suggested that there might be an elevated risk of exposure to mercury gases in the region. However, the researchers felt that enforcement of mercury policies had had an overall positive impact on environmental safety.

Evidence has been found of heavy metals in bodies of water around gold mining areas in Ghana (Hadzi, Essumang, & Ayoko, 2018). Water samples were taken by the World Health Organization from both mining and pristine areas for comparison and were found to have levels of arsenic substantially above the acceptable limit that posed a carcinogenic risk to surrounding communities (as cited in Hadzi et al. 2018). Hadzi et al. (2018) identified areas around the Birim River as the most contaminated from among the samples collected. Their study provided new multicriteria and pattern recognition approaches for making risk assessments of water areas contaminated by heavy metals.

Pollution in the form of heavy metals was found in soil samples around Kumasi Metropolis, Ghana (Akoto et al., 2017). Concerns were expressed about the potential environmental contamination from heavy metals that was the result of smelting and mining activities. Kumasi was used specifically because it was one of the most industrialized cities in the country, leading to the increased chance of metal pollution in the area. Akoto et al. (2017) took 112 samples from the region and across 31 sampling sites and compared them against five samples from a pristine site that did not have heavy metal contamination. Akoto et al. found moderate to extreme contamination among metals such as mercury. The study data also indicated that industrial activities, including mining, were the most significant contributors of metals in the soil surrounding the region (Akoto et al., 2017). This study was yet further evidence of the negative impact of mining activities on the surrounding environment.

Kumasi also was studied by Bortey-Sam et al. (2015), who attempted to determine the potential ecological risk and the risk to human health posed by heavy

metals and metalloids that formed air pollutants around fuel-filling stations. Forty dust samples from filling stations from around the region were studied. Following data analysis, Bortey-Sam et al. concluded that the level of pollutants such as barium in these areas constituted moderate pollution; however, pollutants such as lead were found in concentrations considered high. The results suggested that metals and metalloids could range from moderate to high concentrations in the environment. Based on these conclusions, Bortey-Sam et al. warned that there was significant risk if ingested, rather than by dermal contact or inhalation, because noncarcinogenic values could exceed safety limits.

Dorleku, Nukpezah, and Carboo (2018) studied the impact of small-scale gold mining on levels of heavy metals in the groundwater around the Lower Pra Basin of Ghana. Dorleki et al. brought attention to 65 boreholes drilled around 45 communities in the region between January 2012 and April 2012, then again between June 2012 and October 2012. Analysis of samples of groundwater drawn from the area found the presence of several heavy metals in the groundwater. Particularly high values were recorded for several metals such as iron, manganese, and lead, though fluctuations in level depended on whether it was the wet or the dry reason (Dorleku et al., 2018). The results suggested that boreholes could cause worrisome levels of contamination in the groundwater and that there were specific times of the year when these levels reached particularly high levels.

Akoto et al. (2018) studied heavy metal contamination in Obuasi, Ghana, because of concerns that contamination from heavy metals such as lead, cadmium, and mercury

and metalloids might approach dangerous levels. Soil samples were taken from three locations: commercial sites, residential areas, and tailing dams. Following analysis of the soil samples, Akoto et al. found that all of the communities in the region that they had studied were severely polluted from arsenic contamination. There also were elevated levels of lead, copper, and zinc around city centers where vehicular traffic was heavy.

Because of the level of contamination, Akoto et al. (2018) concluded that there was significant ecological risk in the region. The level of soil ingestion among the communities reached hazardous though noncarcinogenic levels, but the risk of cancer among these communities was 45% higher than average. Consequently, the threat of contamination had reached levels of concern for both the environment and human health (Akoto et al., 2018).

Regarding the level of damage to the environment, Kutah and Matsui (2018) found that surface mining had a significant impact on the sustainability of agriculture in Ghana. The study was conducted because surface mining needs large tracts of land to operate and draws on a significant amount of human labor. Consequently, surface mining poses threats to the environment (e.g., deforestation, soil erosion, water pollution, farmland depletion) and can have a negative impact on human health. Following analysis of small-scale mining operations in the western region of Ghana, Kutah and Matsui concluded that the effluent discharge from small-scale mines posed a threat to the surrounding land and surface bodies of water. The mines also pushed out farmers as they expanded their operations onto the farmers' land. In addition, blood samples from

farmers and other individuals living in the area identified high levels of heavy metals in their blood (Kutah & Matsui, 2018).

Pollution may have the secondary effect of increasing the likelihood of conflicts breaking out in areas where mining is occurring (Twerefou, Ayimpusah, Owusu-Afriyie, Adjei-Mantey, & Bokpin, 2017). Twerefou et al. (2017) examined survey data from 1,458 households across 60 communities from five Ghanaian districts to determine how competition for mineral wealth influenced the chances of conflict. The data indicated that the likelihood of conflicts in mining areas was 56.7%. Although numerous factors mitigated against the chance of conflicts breaking out, Twerefou et al. noted that an increase in pollution in mining areas was associated with an increased 7.1% potential for conflict. Such findings indicated that pollution could have repercussions beyond the typically assessed outcomes of environmental and human impacts.

The environmental impact of mining activities in Ghana has been thoroughly documented. The productivity of agricultural lands surrounding mines has been drastically reduced when compared to farming lands further away from mining sites (Aragon & Rud, 2015). Various levels of heavy metal contamination have been found consistently in the environment. Surveys have revealed concerning levels of heavy metals in the soil around Kumasi Metropolis (Akoto et al., 2017); in the groundwater around Lower Pra Basin (Dorleku et al., 2018); and in the area of Obuasi (Akoto et al., 2018). These metals continue to pose potential health threats to the residents exposed to them.

Kutah and Matsui (2018) noted that practices such as surface mining have been linked to effluent discharge that contaminates the land, pushes out residents, and

contaminates their blood. Mining activities have the potential to impact food sources, water sources, soil, and air. This environmental pollution also has been connected to conflicts in Ghana (Twerefou et al., 2017). The full impact of environmental pollution in Ghana has yet to be explored, but in many parts of the country where mining activities continue, there have been documented instances of health-threatening levels of environmental pollution. Ensuring compliance with environmental policies and regulations may help to address the ongoing environmental pollution in Ghana.

Human Impact

Bortey-Sam et al. (2015) suggested that pollution from the mining industry might affect human health by way of toxic food consumption. Bortey-Sam et al. noted that food consumption was the most likely way that humans were exposed to heavy metal and metalloid contamination. Chicken gizzards and livers were specifically connected to toxic metal exposure in children and adults. Children were found to be at particular risk because they were the most likely to suffer from acute, subacute, and chronic effects related to ingesting pollutants. Bortey-Sam et al. suggested that the elevated risk necessitated the restriction of free-roaming animals in areas around mines, where pollutants were more likely to be heavily concentrated in the environment.

The risk of mining to human health also has been demonstrated among not only residents of the region but also mineworkers (Obiri et al., 2016). A human health risk assessment of artisanal miners was conducted in the Prestea-Huni Valley District of Ghana using U.S. EPA risk assessment guidelines. Water and sediment samples were collected from the region. Following analysis of the samples, Obiri et al. (2016)

concluded that there was an elevated risk of developing cancer and noncancerous diseases to miners who had been exposed to toxic metals in the area. Obiri et al. suggested that new epidemiological studies be conducted to determine the relationship between the identified toxins and diseases identified in the region.

Cobbina, Duwiejuah, Quansah, Obiri, and Bakobie (2015) conducted a study on the cost of exposure to heavy metals to human lives in Ghana. Cobbina et al. investigated the levels of heavy metals in the drinking water surrounding mining communities in Nangodi and Tinga. Seventy-two water samples were drawn and tested. Cobbina et al., who concluded that the level of heavy metals in these water sources was elevated, warned that the consumption of water with elevated levels threatened the health of the individuals living in the area. Consequently, the drinking water in the area needed to be continuously monitored (Cobbina et al., 2015). The results were yet one more indicator of the threat that disregard for environmental regulations posed to humans.

Health care costs have risen as gold mining activity has continued in Ghana (Akpalu & Normanyo, 2017). Akpalu and Normanyo (2017) asserted that Ghana has made increasing efforts to attract foreign investment in its gold mining sector. To do so, Ghana has often overlooked instances of noncompliance with environmental standards that has resulted in an increase in high levels of pollution in mining communities. Akpalu and Normanyo hypothesized that this increase in pollution levels would necessitate high health care expenditures in the polluted communities. Akpalu and Normanyo found that the impact was increasingly affecting the young, who were spending more than their older peers on health care.

Community health impacts also have been studied, this time in the upper west region of Ghana (Antabe et al., 2017). Antabe et al. (2017) found that emergence of the gold mining industry in Ghana facilitated the growth of artisanal and small-scale mining. However, the growth of these mining efforts has resulted in new challenges, including challenges to environment and human health. Antabe et al. noted that the extent to which residents living close to and far away from mining communities have been affected has yet to be studied. Antabe et al. used cross-sectional survey data drawn from 801 participants to better understand self-rated health in these communities. Following analysis of the data, the researchers concluded that residents who believed that they were impacted by odors from mining activities were twice as likely to report their health as being of poor quality.

Individuals living in mining areas who were uncertain about the impact of mining on their health were still 98% more likely to report their health as being poor when compared to those who did not believe that mining had an impact on their health (Antabe et al., 2017). This result indicated as least subjectively poor feelings of well-being. Antabe et al. (2017) suggested that policies be reviewed regarding the enforcement of environmental policies to ensure that best practices were being adhered to and health was being protected.

The impact of mining on human life can be devastating. The health of residents in mining areas can be impacted by the consumption foods or water contaminated by toxins (Bortey-Sam et al., 2015; Cobbina et al., 2015). Heavy metal contamination can work through water systems and impact surrounding soil and vegetation. Communities

impacted by these pollutants require additional investments to ensure that health care needs are being addressed (Akpalu & Normanyo, 2017). Adverse health effects of mining activities are felt not only by community residents but also employees (Obiri et al., 2016). There are a number of ways that mining activity can affect human health negatively. Nonadherence to environmental protection policies can have an impact on communities and people that can result in human suffering and require costly investments in health care.

Management of Ghanaian Mining

Mine officials are under pressure to attract foreign investment (Akpalu & Normanyo, 2017). As a result, serious instances of noncompliance with mining regulations have sometimes occurred. These violations of various environmental standards are broken when mine officials compete against other Sub-Saharan African countries that also are trying to attract foreign direct investments. Consequently, the lack of adherence to standards has led to increasing levels of pollution in many mining communities in Ghana.

One method of improving Ghanaian mining compliance with environmental standards has been through the Akoben program, which was designed to improve adherence to various environmental regulations (Bawua & Owusu, 2018). The Akoben program is an environmental performance rating and disclosure initiative of the GEPA (Sekyi, 2011). Akoben includes an environmental performance measure for mining and manufacturing operations using a five-color rating scheme. The five colors are gold, blue, green, orange, and red, indicating environmental performance ranging from excellent to

poor. Akoben ratings are measured annually and are disclosed publicly to promote population awareness and participation. These ratings measure the environmental performance of companies based on more than 100 performance indicators included in their environmental impact assessments (EIAs).

Sekyi (2011) explained:

> These ratings indicate how well companies have met the commitments they made in their EIAs at the planning stage. Akoben, therefore, complements the EIA process and serves as a monitoring and verification program to ensure that companies follow environmental regulations on a continual basis.

The Akoben rating and disclosure tool was meant to promote adherence in the mining and manufacturing industries in Ghana (Sekyi, 2011). Sekyi (2011) used a case study approach to understand the performance of a mining company over a 3-year review period. Study data indicated that the performance of the company during that period was poor, with toxic and nontoxic waste emission discharges exceeding recommendations. Both arsenic and cyanide were found at excessive levels (Bawua & Owusu, 2018). Bawua and Owusu (2018) stated that to promote compliance, more than a reporting tool was required. They suggested that stricter legal backing and incentives for compliance be added to promote compliance.

Although Bawua and Owusu's (2018) findings did not demonstrate a positive outcome of increasing reporting, an increasing trend in disclosing performance indicators related to mining sustainability was found by Arthur, Wu, Yago, and Zhang (2017). Arthur et al. (2017) examined trends in the Global Reporting Initiative, which disclosed

sustainability reports issued by large, mining companies in Ghana. The researchers drew upon 50 sustainability reports from between 2008 and 2012 that covered 10 large-scale mining companies. Following analysis of the data, Arthur et al. concluded that there was an increasing trend to disclose performance indicators in sustainability reports. These results indicated that progress was being made to improve reporting according to the guidelines set by the Global Reporting Initiative (Bawua & Owusu, 2018). Although not reflective of how those mining companies performed with regard to sustainability, the results did point toward a trend toward increased reporting.

A number of additional factors were cited by Tuokuu, Gruber, Idemudia, and Kayira (2018) as reasons for the failure of compliance. Tuokuu et al. noted two forces that were at odds in Ghana, namely, the significant contribution of gold mining to the Ghanaian economy versus the significant environmental consequences of gold mining. The mining industry has had a negative impact on the environment as well as human health. Tuokuu et al. suggested that addressing several issues might help to encourage compliance. Increased coordination among government institutions could help to ensure more strict oversight of these mining areas, and increasing the number of personnel involved in ensuring compliance also could help, as could increasing community participation in overseeing ways to reduce or prevent pollution in mining areas (Tuokuu et al., 2018). By taking a multipronged approach to address compliance, Tuokuu et al. suggested that it might be possible to reduce pollution.

In at least one other study, Boateng (2017) revealed that attempts to mitigate against the most damaging effects of mining pollution did not have a negative impact on

the fiduciary responsibility of mining companies to increase profits for shareholders. Boateng suggested that efforts to reduce the environmental impact of mining did not interfere significantly with the ability to increase profits. In other words, the mining companies could live up to their environmental responsibilities without detriment to their corporate shareholders.

However, when the companies had to address specific community complaints about their gold mining operations, there was a negative impact on shareholders (Boateng, 2017). Boateng concluded that making investments to meet their responsibilities to the community interfered at least somewhat with the companies' ability to make profits. Even though attempts to mitigate against pollution had no negative impact on shareholders, addressing specific community complaints did. Boateng suggested that mining companies might not always be incentivized to respond to community needs because of the impact on shareholders.

One of the difficulties of enforcing environmental standards has been the prevalence of artisanal gold mines in Ghana (McWhorter, 2017). Artisanal and small-scale gold mining activities have helped to provide employment for individuals throughout Africa. These smaller gold mines have traditionally provided the income for food and shelter that these families require. However, the government's capacity to regulate gold mining in Ghana has been acknowledged as being limited.

Artisanal gold mines have complicated the ability of the GEPA to enforce environmental policies and have added another potential threat to the environment (McWhorter, 2017). McWhorter studied this phenomenon using a case study approach

and found that the regulations in Ghana should have been sufficient to regulate the artisanal gold mining industry. However, because much of the artisanal gold mining sector operated informally, these informal operations were pressured to drive profits for locals and take shortcuts in operations, thus exposing miners and the surrounding community to safety and health risks (McWhorter, 2017). The results indicated that smaller scale gold mining operations experienced unique pressures in comparison to corporate mining operations. Consequently, artisanal gold mines have operated informally and have attempted to maximize profits in such a way that have threatened the environment and human safety.

Andrews (2016) examined the ways that mining regulations occurred in the context of CSR in the hope that the concept would encourage responsible practices in Ghana. Andrews noted that when more lax regulations and policies were in place, corporations were less compelled to act in ways consistent with CSR. In the specific context of Ghana, however, Andrews noted that local factors increased challenges in the mining sector. Extant mining regulations did not outline corporate societal responsibilities, resulting in a lack of domestic institutional mechanisms that could enforce companies to behave in ways consistent with CSR. There was, therefore, less motivation for companies to behave responsibly (Andrews, 2016). Without a strong compulsion to behave responsibly, mining permits favored corporate desires without any need to act in ways that took into account societal concerns (Andrews, 2016). Andrews suggested the need for more domestic mechanisms and language that would require

corporations to behave in ways that would sustain and positively affect the lives of individuals living in mining communities.

The need for domestic mechanisms and language regarding CSR is important because the exploration and extraction of mineral resources in Ghana has been considered among the most destructive practices to the environment and society (Amponsah-Tawiah & Dartey-Baah, 2015). Amponsah-Tawiah and Dartey-Baah (2015) noted that over the previous 40 years, mining activities have been responsible for severe environmental and humanitarian disasters. Mining in Ghana has been responsible for not only the erosion of a way of life and its cultural core values but also the loss of traditional livelihoods because environmental pollution has made work such as farming and fishing far more difficult. CSR emerged in response to community complaints about the mining industry.

Andrews (2016) argued that adherence to socially responsible policies was weak, but Amponsah-Tawiah and Dartey-Baah (2015) found that there had been at least some improvement in corporate behavior, suggesting that companies had attempted to increase investment in the country or create sustainable livelihood programs. However, Amponsah-Tawiah and Dartey-Baah acknowledged that corporations tended to choose where to focus their positive efforts rather than take an approach that would address multiple concerns.

McWhorter's (2017) results were related to CSR, the desire to be responsible to society. This responsibility was further explored by Patnaik, Temouri, Tuffour, Tarba, and Singh (2017), who examined mining in Ghana conducted by a subsidiary of a U.S.-based gold MNE. In this context, the identity of the subsidiary was influenced by its

larger U.S. MNE. However, the ability of the MNE to enforce its culture on the subsidiary was not always a smooth process. Because their sense of social responsibility influences companies' behaviors that affect the surrounding culture, companies hoping to enforce a socially responsible culture that adheres to policies benefiting society, including environmentally friendly behaviors, must overcome cultural challenges by localizing their practices and making those practices relatable within the subsidiary (Patnaik et al., 2017).

There has been a particular danger of contamination noted among artisanal mines, where an excessive amount of gold has been lost to tailing streams, that is, the runoff from mines that form slurries from the separation process (Bansah, Dumakor-Dupey, Stemn, & Galecki, 2018). The excessive loss has been due to poor technology and the lack of skills used in these artisanal mines. However, these tailings have become sources of revenue for larger scale mining operations that have the technology to recover valuable material from the runoff. These circumstances have resulted in a symbiotic relationship that allows larger companies to derive revenue from the tailings and pay the artisanal mines for access. This relationship incentivizes tailings to be allowed, despite the potential environmental dangers posed by this runoff (Bansah, Dumakor-Dupey, Stemm, & Galecki, 2018). This example shows how mine operations might be incentivized against safeguarding the local environment. On both the artisanal and the large-scale mining sides, the potential for profits drives both types of mines to value profits over environmental preservation. Understanding how managers act as stakeholders and how

the profit motive affects behavior will help to inform the process of protecting the Ghanaian environment from mining activities.

Though Bansah, Dumakor-Dupey, Kansake, et al. (2018) found that there are sometimes incentives for mines to ignore environmental protection, Famiyeh and Kwarteng (2018) asserted that regulatory agencies could play a significant role in improving the environment. Famiyeh and Kwarteng collected survey data to better understand the practices in mining extraction and manufacturing. After examining the survey data, Famiyeh and Kwarteng found that environmental management was primarily driven by regulatory organizations in Ghana that exerted pressure on mining companies to adhere to regulations regarding extractive and manufacturing aspects of the mining industry. Famiyeh and Kwarteng concluded that regulatory bodies were important because they developed good environmental policies, influenced companies to implement those policies, and acted as monitors to ensure that actions influencing the environment were improved.

The most significant influence that Famiyeh and Kwarteng (2018) found was that successful implementation of environmental policies influenced other organizations to implement those policies. The data suggested that the importance of achieving success in implementing environmental policies, even if in just a few cases in a limited context, caused other mining organizations to mimic the approach in hopes of achieving similar success. Tightly monitoring and enforcing regulations would lead to further implementation throughout the mining industry.

Macdonald et al. (2014) suggested that companies and organizations that did not comply with GEPA regulations risked causing harm to the environment, specifically aquatic ecosystems. Macdonald et al. noted that for regulations to be effective, they had to be accompanied by comprehensive plans that included training and educational programs for miners, processors, and regional authorities overseeing mining activities. By educating stakeholders about the impact of poor environmental practices and the benefits of appropriate ones, these stakeholders could better control and monitor the impact of mining activities in a region. Part of any comprehensive plan should include ways to monitor and prevent the dispersal of pollutants into waterways (Macdonald et al., 2014). By creating regulations and comprehensive monitoring and prevention plans in tandem, such as comprehensive approach could be more effective in promoting environmentally sustainable practices.

Summary and Conclusions

The enforcement of environmental regulations in Ghana is complex. Even though mining plays an important role in the livelihoods of many locals, mining activities continue to threaten the environment. Mining has had positive and negative impacts in Ghana, boosting the economy but also threatening the health and environment of the nation. The literature on mining in Ghana has included some discussion about the difficulties of enforcing policy, but there has been little research on the role of managers to ensure compliance with GEPA regulations. The result has been a gap in the literature regarding challenges facing mining managers in their efforts to comply with GEPA regulations.

The qualitative case study approach focused on the challenges facing Ghanaian mine managers in their efforts to comply with GEPA regulations, according to NGO members tasked with Ghanaian environmental issues. The significance of this study was that it sought to investigate the environmental and health impacts of the mining sector on Ghanaian communities (Basu, Phipps, et al., 2015). The findings will serve as a guide in providing insight into ways that managers comply with GEPA regulations and standards (Ahorbo, 2014).

Chapter 3: Methodology

Introduction

The purpose of the study was to explore the perceptions of NGO stakeholders of the challenges faced by managers in the Ghanaian mining industry tasked with GEPA compliance. The study was significant for two reasons. First, gaps in the literature regarding the Ghanaian mining industry and the challenges managers faced in ensuring GEPA regulations were addressed. Second, the findings could inform the means by which mine managers responsible for overseeing ways to reduce or prevent pollution could ensure that they were addressing the challenges. By addressing those challenges, mining mangers may be better positioned to ensure compliance with GEPA regulations.

Included in Chapter 3 are details about the design of the study, the sampling method, and data collection and analysis. Also presented is the justification for the research design that was followed. Chapter 3 also presents information about the participants, ethical considerations, recruitment procedures, and instrumentation used.

Research Design and Rationale

The researcher designed the study to answer one RQ: What are the perceptions of NGO stakeholders of the challenges faced by managers tasked with GEPA compliance in the Ghanaian mining industry? This qualitative case study did not include a correlative or experimental design that required dependent or independent variables. Data were collected from semistructured interviews with NGOs focused on Ghanaian environmental sustainability.

The researcher considered use of a case study appropriate to facilitate the collection of in-depth data on a subject that has been the focus of little research. Rich data sets served as the basis to identify themes relevant to the experiences of managers working in the Ghanaian mining industry and to understand why implementation of GEPA regulations continues to be difficult. The use of triangulation of the data sources was considered important to achieve data saturation. Creation of these data sets facilitated the use of content analysis to develop themes found in the research.

Role of the Researcher

The researcher was responsible for guiding the participants, ensuring the accuracy and integrity of the data, and complying with Walden University's Institutional Review Board (IRB) guidelines for conducting ethical research. The researcher minimized interference in the participants' responses to the interview questions and served mostly to clarify their responses or questions prior that might have been confusing to the participants. In addition, the researcher observed the respondents and documented nonverbal cues, signals, and communication.

Following data collection, the researcher analyzed and categorized the data. Data analysis involved reviewing the collected data to find themes and possible subthemes. From these themes, it was possible to identify thematic similarities among the responses that characterizes the challenges that managers faced while attempting to implement GEPA regulations in the Ghanaian mining industry. To ensure the honesty of the participants' responses, the researcher assured them that their responses would remain anonymous. After obtaining signed consent from the NGO participants, the researcher

conducted the interviews using open-ended questions (see Appendix). To ensure ethical research, the researcher took a collaborative Institutional Training Initiative web-based training course on ways to protect human research participants.

Overall, the researcher was responsible for the analysis and interpretation of the data collected. The researcher also played a role in maintaining the NGO participants' confidentiality. They selected convenient neutral places or arenas to be interviewed to prevent interference from any elements that could have influenced their responses. The researcher had no prior relationship with the NGO participants. The objective of this study was to identify best practices that could contribute to consistent adherence to GEPA regulations in the Ghanaian mining industry.

Methodology

This section provides details about the target population, sample and sampling strategy, research design, and rationale for the study. A mining company in Ghana was contacted, and recruitment of the participants was conducted by e-mail. Potential participants were informed of the study's purpose and their rights prior to agreeing to join the study. Also discussed in this section are details about the interview questionnaire used to collect the data. The researcher conducted the one-on-one interviews with answers recorded and supplemented by field notes. To analyze the data, the researcher used NVivo software to develop the themes.

Participant Selection Logic

The target population were NGOs focused on improving Ghanaian mining companies' compliance with GEPA regulations. The researcher used purposive sampling

to recruit nine individuals employed at NGOs focused on Ghanaian mining pollution regulation issues. The NGO employees had to have at least 3 years of experience dealing with Ghanaian mining pollution regulation issues to join the study. Participants were asked to respond to the introductory e-mail only if they met the criterion. The number of participants was small compared to the samples required in quantitative research, but the sample size was appropriate to provide a large amount of meaningful information (Boddy, 2016). The smaller sample was sufficient to achieve data saturation because of the richness of the data.

Instrumentation

Interviews were the primary data collection instrument. The researcher intervened only if the participants needed clarification about the questions. The researcher also took handwritten notes to capture the participants' nonverbal body language, which might have emphasized certain points that they were trying to make.

The researcher developed the interview questions to obtain information from the participants about the challenges faced in the Ghanaian mining industry. Experts in the field of study reviewed the survey questions to ensure that they addressed the RQ adequately. Expert review is sufficient to establish content validity (Office of Educational Assessment & Accreditation, 2018). The semistructured nature of the interviews allowed the participants to provide in-depth responses, thus facilitating the collection of data sufficiently rich enough to address the research topic.

Procedures for Recruitment, Participation, and Data Collection

Recruitment and participation. The researcher established access to the NGO participants through personal and formal networking. Walden's University IRB gave me permission to collect the data to ensure the protection of NGO participants (IRB approval #01-30-20-0609921). The partner organization sent invitations on the researcher's behalf to potential NGO participants who met the criterion to join the study.

A purposive sample of nine participants were interviewed. The preinterview process began with the participants receiving introduction and recruitment letters. The recruitment letters contained details about the purpose and importance of the study, eligibility criterion, and data collection.

A total of 20 invitations sent by the partner organization on the researcher's behalf to potential NGO participants focused on Ghanaian mining sustainability issues. Of these 12 NGO participants, nine of them participated in the study. The nine NGO participants signed the consent form before being interviewed. Only 12 NGO participants who met the criterion responded. Prospective participants received written notification about the voluntary nature of being in the study and their right to either stop the interviews or withdraw from the study at any time. A small sample of individuals employed by NGOs with at least 3 years of experience with Ghanaian mining pollution regulation issues took part in the study.

The researcher conducted the face-to-face interviews at times suitable to the participants. Participants who could not attend the face-to-face interviews were interviewed over the telephone, despite mixed views about such interviews (Antabe et al.,

2017). The researcher recorded the telephone interviews to ensure reliability and required the participants to validate their individual interview transcriptions. The participants responded to questions about their knowledge of enhancing compliance with GEPA regulations and standards relevant to the Ghanaian mining industry.

The NGO participants took part in the study voluntarily and received no payment or special gifts in return for their participation. They had the right to stop participating in the study at any time without penalty by contacting the researcher via telephone or e-mail. The data files will be kept secured in a single secured cloud server that only the researcher will have access to. They will be kept for 5 years, as required by Walden University, before being shredded or destroyed digitally.

The nine senior managers employed by NGOs focused on improving the compliance of Ghanaian mining companies with GEPA regulations. Selection of the participants was purposive, based on the assumption that the participants had at least 3 years of experience with Ghanaian mining pollution regulation issues (Ahorbo, 2014). Only the researcher had access to the data in an effort to safeguard the privacy of the participants, the confidentiality of their responses to the interview questions, as well as the privacy of the partner organization and links that could have recognized the participants. To meet the criterion of an adequate sample size in qualitative research, a small sample of nine NGO participants took part in the study (Ahorbo, 2014). In qualitative studies, a small sample size ranging from eight to nine participants is sufficient to achieve data saturation (Boddy, 2016). The participants were nine senior

managers employed by NGOs who had at least 3 years of experience with the phenomenon (Andrew, 2016).

Data collection. The researcher used a semistructured interview question list and provided clarification to any of the interview questions if asked to do so by the participants. The question list was used in all interviews to maintain consistency of the interview process. The researcher recorded the interviews using a voice recorder and took field notes to describe nonverbal cues manifested by the participants. Each interview lasted for about 30 minutes. After completing the interviews, a final e-mail communication was sent to the participants reviewing the way that the data would be used, ensuring the anonymity of the participants, and listing the researcher's contact information. No other follow-up was planned.

Data Analysis Plan

Data analysis began first with the transcriptions of the voice recordings and the handwritten notes being combined into a single document. The researcher then reviewed the document, reading the interview responses line by line. Recurring key words, phrases, and topics were highlighted to create the original set of raw categories. The researcher reviewed these categories to find and combine redundant topics to create the final themes.

NVivo was used to support creation of the themes from the data. NVivo is a type of qualitative data analysis software that is suitable when working with text and multimedia information to conduct a deep analysis of the results. NVivo allows users to review and organize data easily, classify information, look up the categorized

information, and sort individual elements of information as well as entire categories. Information can be searched and linked, allowing for relationships in the data to emerge. NVivo also facilitates visualization of data that helps to explore the connections between and among various items of data. By connecting these related items, the investigation was transparent.

Issues of Trustworthiness

The quality of qualitative research relies on trustworthiness, dependability, and transferability (Yin, 2018). Creswell (2014) suggested that using triangulation, allowing member checking, presenting negative or discrepant data, disclosing the potential for bias, and journaling as ways to improve the quality of the findings. The most important factor is the objectivity of the researcher, who is the primary data collection instrument. Qualitative researchers must remain conscious of the potential for their own experiences and opinions to bias data collection and analysis. In addition to maintaining field notes, the researcher used member checking of the interview transcriptions to ensure their accuracy.

Transferability

Transferability of the findings was limited by the small sample size and drew on the personal experiences of nine NGOs focused on Ghanaian mining GEPA compliance. As such, there was limited ability to transfer the findings to other contexts. However, the recruitment criterion did allow the findings to be drawn from individuals with satisfactory experience in dealing with the challenges of mangers ensuring GEPA compliance of their mining companies. Data collection was made more dependable and credible by

triangulating the data. Semistructured interviews, field notes, and document review provided the sources of the triangulation.

Dependability

Yin (2018) asserted that field notes and journaling are important for future researchers to replicate studies, and Gibbs (2007) noted the importance of checking transcriptions for mistakes and avoiding inconsistencies in coding. For this reason, this researcher thoroughly documented each step, reviewed the interview transcriptions for errors, and employed data analysis software to attain a level of consistency in iteratively comparing the data to the codes. The objective of dependability was noted through a commitment to awareness and to timely provision of applicable information as it unfolded.

Ethical Procedures

The NGO participants were contacted through the partner organization using e-mail invitations or the public postal system. The partner organization sent invitations and the consent form to potential NGO participants by regular e-mail or Ghana mail. If the consent form was signed and returned, it signaled the participants' willingness to be in the study.

Human participation in research requires that the participants be fully informed before consenting to take part in any studies. Potential participants were instructed fully about the purpose of the study and their rights. Participants were advised that they could withdraw from the study at any time without repercussions.

Participants were told the full purpose of the study, including how their answers would be used during the research and that their answers would be kept entirely anonymous. In addition, the participants were told that their names would be masked and would appear only in the raw data. Study results maintained their anonymity using only their masked assigned names. Participants were assured that only the researcher had access to the raw data and that all other information would be anonymized in published form. Data were secured using a single secured cloud server that only the researcher had access to. The data will be held for 5 years before being deleted digitally or shredded.

Summary

The qualitative case study involved semistructured interviews, field notes, and document review to address the RQ. The case study format was deemed appropriate to facilitate the collection of richly textured data on a research topic that has previously seen little exploration. The study sought to examine the challenges facing managers in their effort to implement GEPA regulations in the Ghanaian mining industry, as perceived by NGO stakeholders. The researcher used content analysis to identify themes that emerged from the analysis of the data. Chapter 4 presents the study findings, provides descriptive statistics of the study sample, and discusses methodological issues.

Chapter 4: Results

Introduction

The purpose of the study was to obtain the perceptions of nine NGO stakeholders of the challenges faced by managers in the Ghanaian mining industry tasked with complying with GEPA regulations. The study was conducted to advance knowledge regarding Ghanaian mining managers tasked with GEPA compliance with rules and regulations. The researcher used a qualitative case study approach, which was appropriate to conduct this exploratory study (Smith, 2015) .The case study approach is appropriate to investigate phenomena best addressed by "how" and "why" RQs (Savin-Baden & Major, 2013). For the current study, the phenomenon under investigation focused on the challenges that mining managers in Ghana faced in complying with GEPA regulations.

Purposive sampling was employed to recruit nine individuals employed by NGOs focused on Ghanaian mining interests. Data were collected from semistructured interviews with the participants, field notes, and a review of documents (Yin, 2018). The case study approach required the use of in-depth interviews with 8 to 12 NGO employees involved in the day-to-day operations that had the potential for GEPA regulatory noncompliance (Stake, 2005).

Data analysis required the use of triangulation between sources of data to achieve data saturation and facilitate the creation of rich data sets. Creation of these data sets facilitated the use of content analysis to develop the themes. The researcher employed content analysis to identify recurring themes, ideas, and phrases. The research was designed to address one RQ: What are the perceptions of NGO stakeholders of the

challenges faced by managers tasked with GEPA compliance in the Ghanaian mining industry?

The interview questions were developed to explore the experiences of the participants. The data analysis was conducted using Maguire and Delahunt's (2017) recommendation for content analysis. As such, the reviewer drew from a six-step process to identify the themes that emerged from the analysis. This chapter includes a description of the data collection protocol, demographic information about the participants, and the participants' professional experience and educational attainment considered or deemed relevant to the study. Data collection and analysis techniques are explained, as are trustworthiness and validity.

Setting

As presented in Chapter 3, the sample comprised nine individuals employed by NGOs focused on Ghanaian mining pollution regulation issues. The geographic distribution of the NGO participants made it necessary to conduct some interviews over the telephone. Nine interviews were conducted, four in a face-to-face format and five over the telephone. The interviews were conducted and recorded at times suitable to the NGO participants, and all NGO participants acknowledged the iPhone recording application of interview sessions, as stipulated in the consent form. The researcher conducted face-to-face interviews with four NGO participants in convenient, agreed-upon neutral locations, such as hotel conference rooms, private arenas, and offices. Privacy was deemed necessary during the telephone interviews, so the locations were chosen by the NGO participants.

Demographics

The partner organization sent 20 invitations on the researcher's behalf to potential NGO participants with at least 3 years of experience with Ghanaian mining pollution regulations issues to participate in the research project. As shown in Table 1, the participants were ages 27 to 45 years. Eight participants were men, and one was a woman. Five participants held master's degrees, and four had bachelor's degrees. Three of the participants were field officers, one was a chief field director, one was an assistant field director, one was an assistant executive director, one was an executive director, one was a GESI officer, and one was a community external regulations officer.

Table 1

Demographics, Professional Experience, and Educational Attainment

Participant	Educational attainment	Title	Years of experience	Age	Gender
1	Master's	Field officer	5	28	M
2	Master's	Field officer	7	42	M
3	Master's	Chief field dir.	10	35	M
4	Bachelor's	Asst. exec. dir.	10	45	M
5	Bachelor's	Asst. field dir.	8	38	M
6	Bachelor's	Community dir.	3	27	M
7	Master's	Exec. dir.	11	43	M
8	Bachelor's	GESI officer	11	32	F
9	Master's	Field officer	5	27	M

Data Collection

Data were collected through semistructured telephone or face-to-face interviews. In qualitative research, focus meetings, participant observations, and interviews are different methods of data collection available to researchers (Creswell, 2014). Conducting interviews was the most appropriate data collection technique because it required face-to-face contact with the participants (Creswell, 2014). The researcher

interviewed the participants in convenient, agreed-upon neutral locations after the participants had read and signed the consent form. The participants responded to open-ended questions related to their knowledge of enhancing compliance with GEPA regulations and standards in the Ghanaian mining industry. Data collection involved obtaining NGO stakeholders' perceptions of the challenges faced by managers in the Ghanaian mining industry tasked with GEPA compliance.

Some participants chose to be interviewed over the telephone. E-mail threads were not chosen for this research, even though social researchers have considered using e-mail interviews as a feasible and favorable recourse (Boddy, 2016). The sample comprised nine senior managers employed with NGOs focused on improving Ghanaian mining company compliance with GEPA regulations. Each semistructured in-person interview lasted 20 to 40 minutes. The interviews were recorded using an iPhone recording application. No exceptions or deviations from the methodology described in Chapter 3 were encountered.

The participants offered thorough responses to the open-ended interview questions. The purpose of the study was to explore the perceptions of NGO stakeholders of the challenges faced by managers in the Ghanaian mining industry tasked with GEPA compliance. Expert in the field of study evaluated the reliability and validity of the interview questions and the interview protocol. Field experts approved the interview questions and made no recommendations to add or remove any interview questions.

The first step involved preparing the interview questions. In the second step, three NGO employees with extensive knowledge of the Ghanaian mining sector reviewed the

interview questions and found them suitable for use in the study. The last step involved using the first two steps to examine the appropriateness of the interview questions and the data collection process.

The researcher interviewed participants who met the minimum criterion and signed the informed consent. Participants received written commitments from the researcher to maintain the confidentiality of their interview responses and noncoercion to join the study. The interviews took place in neutral environments conducive to the participants providing honest answers to the interview questions. Each interview lasted between 40 and 60 minutes. Participants provided answers to open-ended, nonleading, and probing questions.

The researcher transcribed the verbatim audio recordings of the interviews. Through the process of member checking, the participants either validated the accuracy of the transcriptions or expressed the need for the researcher to make amendments to the transcriptions (Yin, 2018). The recordings and transcriptions of the interviews will remain available to the NGO participants if they make a request to obtain them.

Data Analysis

The researcher interviewed individuals employed by NGOs who had at least 3 years of experience with Ghanaian mining pollution regulations to obtain their perceptions to address the RQ: What are the perceptions of NGO stakeholders of the challenges faced by managers tasked with GEPA compliance in the Ghanaian mining industry? Eight interview questions aligned with the RQ guided data collection:

1. What resources does your NGO provide to mining managers in Ghana to comply with GEPA regulations?
2. How do you interact with Ghanaian mine managers regarding environmental stewardship?
3. How do you interact with Ghanaian mine owners regarding mining and environmental stewardship and GEPA regulatory compliance?
4. What is the duty of organizational culture regarding GEPA mining regulations and standards?
5. What conflicts of interest exist among government officials, government regulators, mine owners, and mine managers?
6. How can domestic and international stakeholders improve Ghanaian environmental regulation compliance?
7. What deficiencies exist in the relationship between mine managers and government regulators?
    a. What programs and practices can Ghanaian mine managers adopt to improve environmental stewardship?
8. What further steps have the Ghana government and the mine owners taken against GEPA mining regulatory noncompliance in the industry?

Asking in-depth interview questions helped to address the RQ. The researcher asked Interview Question 1 (IQ1) to discover the resources that the NGOs provided to Ghanaian mining managers to comply with GEPA regulations and standards in the mining industry. IQ2 and IQ3 related to how the NGOs communicated with mine

managers and mine owners regarding mining, environmental stewardship, and GEPA regulatory compliance. IQ4 helped to discover the duty of organizational culture regarding GEPA mining regulations and standards. IQ5 pertained to the conflicts of interest among government officials, government regulators, mine owners, and mine managers. IQ6 explored ways that domestic and international stakeholders could improve Ghanaian environmental regulation compliance. IQ7 helped to explore deficiencies in the relationship between mine managers and government regulators. IQ7a pertained to the programs and practices that Ghanaian mine managers could adopt to improve environmental stewardship. IQ8 was asked to identify any further steps that the Ghanaian government and the mine owners have taken against GEPA mining regulatory noncompliance in the industry. Maguire and Delahunt's (2017) six-step process was employed to identify recurring phrases, ideas, and themes in the following order:

1. Becoming familiar with the qualitative data.
2. Generating the initial thematic codes.
3. Integrating the codes into larger themes.
4. Reviewing the extant themes for verification.
5. Defining the themes.
6. Writing up the findings based on the themes.

The familiarization phase of this analysis required the researcher to review the data thoroughly. During this process, the researcher kept in mind a series of potential first codes. However, no application of codes was conducted at this stage, which simply involved reading and rereading the data to become familiar with them.

The second phase of the data analysis required the generation of initial codes for actual application based upon notes taken during the transcription phase. The researcher used NVivo to create codes that could be applied to groups of highlighted text that could later then be referenced easily. The third phase of the data analysis comprised the search for themes by grouping different codes into larger groups that were similar based on keywords, phrases, and ideas found in the data. However, the themes were not finalized at this point.

The fourth phase of the data analysis was a review of the themes to identify themes that were too diverse. The purpose of this review was to identify and separate themes that contained quotes that were too distinct. The researcher also collapsed similar themes into larger themes that contained groups of codes that were highly similar to each other.

The fifth phase of the data analysis involved writing up single sentence to summarize the essential nature of each theme. These sentences were then applied within the Excel output to typify the included quotes. Finally, in the sixth phase, the findings were written up to highlight how the quotes appropriate fit into the larger themes and addressed the RQ.

The data analysis resulted in the emergence of four themes:

Theme 1: NGO role as advisor limited the ability of the NGOs to help mine managers to comply with GEPA.

Theme 2: Small, tight-knit community of government officials and senior mine managers created conflicts of interest.

Theme 3: Investment in mining companies.

Theme 4: Actual actions by NGOs.

The collected data did not include an abundance of discrepant data. Most of the researcher's efforts were focused on collapsing similar themes into fewer larger themes that contained similar groups of codes. Data that did not fit into larger codes or themes were not included. Although they formed interesting data points, they did not align with other statements to form larger themes that could typify the experiences of the participants.

Evidence of Trustworthiness

The issues of trustworthiness and dependability were addressed by the researcher in Chapter 3 and are presented here again, given that these issues impact the quality of qualitative research (Yin, 2018). Creswell (2014) noted that many issues may negatively impact the quality of research. However, in the study, the most pressing issue identified was researcher bias. As such, the researcher remained conscious of the bias and performed member checking to ensure the accuracy of the data and the field notes.

Another issue was the limited transferability of the results because of the small sample size. The recruitment criterion mandated that only individuals with direct experience regarding the study phenomenon were eligible to be in the study. This criterion helped to improve the generalizability of the results by increasing the degree to which the participants could speak to common experiences in the Ghanaian mining industry.

The final issue addressed by the researcher was that of dependability. Field notes were taken by the researcher, which Yin (2018) indicated could be used by future researchers to conduct similar studies. Most importantly, the transcriptions were checked for mistakes and inconsistencies (Gibbs, 2007). During the initial phase of analysis when the researcher was becoming familiar with the data, documents were reviewed for errors to ensure the dependability of the findings.

Results

In qualitative analysis, themes can be directed toward addressing multiple RQs. However, in this study, only one RQ was generated. As such, all themes identified were directed toward answering the RQ: What are the perceptions of NGO stakeholders of the challenges faced by managers tasked with GEPA compliance in the Ghanaian mining industry? The themes identified to address this RQ are discussed in detail in the next section.

Theme 1: NGO Role as Advisor

The first theme indicated that the role of the NGOs only allowed them to provide limited support to the mine managers to comply with GEPA.

Participant 1 explained:

> For my organization, we do not work directly with mining companies; rather, access the impact of their operation in the concession area. In terms of supports, when our research reports are out, it is for them to review the report and act on it. The truth of the matter is that industries are not receptive to critical voices.

Participant 1 noted that the NGOs did not work directly with mining companies, limiting their effectiveness. The circumstances limited the effectiveness of the NGOs to issuing reports, which often came under criticism from the mining companies themselves.

Participant 6 mentioned other actions that the NGOs could take:

> CAMP Ghana as an advocacy-based organization, we seek to engage our stakeholders such as the mining companies in our operational areas on the effect of their environmental practices to insist their stakeholders' fulfillment with the [GEPA] regulations.

Results indicated that though the NGOs had limited effectiveness, they did remain engaged in attempting to drive increased compliance with GEPA regulations. The NGOs could issue reports covering critical issues. However, they also could be more active in their approach and engage with various stakeholders in the mining industry to win more support for the implementation of GEPA regulations.

Theme 2: Small, Tight-Knit Community of Officials

There were indications in the data analysis that compliance with GEPA was hampered by various influential officials.

Participant 1 noted:

> You have the Minerals Commission, which is the promoter of mining with private investors... and the referee. When a regulator of one who is the promoter of a sector and the regulator of a sector, you can really tell in whose interest the organization is going to act when mining investment is coming. They are also regulating the sector at the same time.

The influence of various stakeholders on GEPA compliance, as indicated by Participant 4, was more than political officials who influenced GEPA compliance:

> Ghana mine owners, managers and government officials, and regulators are related or known each other, creating conflicts of interests that make enforcing GEPA difficult. Conflicts of interest in the mining sector are particularly critical because if they are not recognized and controlled appropriately, they can undermine the fundamental integrity of officials, decisions, agencies, and governments.

These results indicated that some stakeholders negatively influenced the implementation of GEPA. These officials included mine owners, government officials, and commissions that promoted the interests of mining facilities. Consequently, there were many potential sources of interference in GEPA implementation.

Theme 3: Investment in Mining Companies

The participants indicated that investments in mining companies minimized the interests of Ghanaians and maximized the interests of companies, including MNEs.

Participant 1 commented:

> The country is supposed to have 10% equity shares in multinational mining companies, but as of now, the country has 15 to 20 multinational mining companies. The country has lost the 10% equity in multinational mining companies. The country forfeited that 10%, so you can look at the extractive Ghana gateway and look at the previous reports and government forfeits.

> As an NGO, we do not know why, even for AngloGold, before they closed in 2015, as the country has given its 10% equity. Then I think Newmont, too, all because they have this development agreement that they are bringing in equipment worth over USD$500,000,000, but that USD$500,000,0000 is not money; these are assets of the company that they are going to work with things they even cleared free of charge, their personnel and whatever, and they are going to cover all these costs before getting paid for any form of corporate tax.

Participant 1's statement indicated that the investments of Ghanaians in various mining enterprises yielded few benefits for local inhabitants. Rather, the interests of the companies themselves took precedence.

Participant 5 mentioned that the issue was compounded by how these issues were covered in the media:

> In the media, when Newmont put up the statement that they spend $100 million on corporate social responsibilities, it taken [*sic*] hook, line, and sinker, but when the community person say that Newmont operations polluted my water bodies, they would have to call whoever is the journalist doing that story would have to revert to Newmont and cross check to see if indeed whether they have polluted the water bodies.

The results suggested that the concerns of mining companies supplanted the concerns of Ghanaian citizens. Public investments in these companies were used to meet the companies' own ends without any regard for the public. Further, these companies

were covered very favorably in the media, but concerns about mining operations were minimized.

Theme 4: Actual Actions by NGOs

The NGOs took a variety of actions to encourage adherence to GEPA.

Participant 2 stated:

> We sensitize the community on the critical areas, [and] the critical area depends on the environment and the collaboration. So, mining advocacy has actually evolved. You know, over the years, mining companies saw some of our activities as antagonistic, and so they were not receptive and saw some of us enemies.

Participant 2 focused on the work that the NGOs could do in the community to pressure companies to adhere to GEPA. The NGOs were not necessarily antagonistic and did try to cooperate with the companies; however, the companies were not always responsive or willing to cooperate.

Participant 5 stated, "When we are doing our research, we send them our request for permission to sample within their community, but our letters were never acknowledged."

Participant 9 also noted the pushback to NGO requests:

> We periodically request the companies' own environmental reports. There are several times we officially write to them, and they make it available to us. Then we study the reports and make our recommendation. That is the first one, but that is very formal. I must say that we have not been too successful with that because in most cases, they are unwilling to release this information to us.

The NGOs had several avenues of action available to them. At times, they coordinated with the public directly to increase awareness about mining companies and increase pressure on the companies to comply with GEPA. However, even when they tried to coordinate with the mining companies, they often found that it was difficult to encourage cooperation.

NGO Participants' Responses to Interview Questions

The researcher collected responses from nine NGO participants to seven interview questions. IQ1 pertained to the exploration of resources that the NGOs provided to Ghana mining managers to comply with GEPA regulations and standards in the Ghana mining industry. In response to IQ1, Participant 1 indicated that the mining industry engaged in some forms of rights abuses, including the destruction of farmland and public streams, the unlawful arrest of community members who refused to allow mining activities on their land, and many more. These happenings highlight the reason for dialogue with community members and the industries or companies. The NGOs represent the communities affected by mining activities. They negotiate with the mining companies to resolve environmental issues.

Participant 2 noted in one interview response that the NGOs encouraged the mining companies to be more assertive in their protection of the environment. The NGOs advocated for farmers, who struggled to feed their families because their lands had been affected by mining activities. The NGOs ensured that farmers affected by mining activities were compensated according to the mining act, and they called for more actions to be taken to ensure that the farmers would not encounter these same issues in the future.

The goal of the NGOs was to help community members to take a calm and measured approach rather than subscribe to violence. Participants 3, 4, and 5 all agreed that the NGOs sought to ensure that the mining companies would comply with GEPA regulations and standards. Environmental pollution decreased when the mining companies followed GEPA guidelines; however, society worried when the mining companies failed to comply with GEPA regulations and standards.

Participant 6 also agreed that the NGOs ensured that the mining companies adhered to the standards set forth in the laws of the country by the GEPA. The NGOs served as a grassroots advocacy to create awareness about GEPA regulations and standards through community or public receptions town hall meetings, and follow-up meetings. Participant 7 added that it was the duty of the NGOs to create awareness of the legal and regulatory framework in the mining sector and to ensure the use of the UN's guiding principles in business, human rights, and other protocols related to the mining sector.

Participant 8 stated that the NGOs served as an advocate for community welfare and social change and ensured that the mining companies followed GEPA regulations. The NGOs also were responsible for seeing that the mining managers were helping to ensure that activities at the mining sites were not causing harm to society. The NGOs ensured that the mining companies adhered to GEPA regulations. Participant 9 concluded that the NGOs assessed the impact of mining operations.

In terms of supports, the NGOs offered significant avenues to ensure that the mining managers abided by GEPA regulations so that the mining operations would

benefit the local communities. The NGOs also focused on advocacy at both the policy and decentralized levels to strengthen their role in influencing policies and practices that hindered community access to safe water, sanitation, and hygiene.

IQs 2 and 3 were asked to explore how the NGOs communicated with the mine managers and mine owners regarding mining, environmental stewardship, and GEPA regulatory compliance. In response to these two IQs, Participant 1 expressed that the NGOs represented the communities and did not deal directly with the owners of the mining companies when there were issues. Instead, they dealt most often with the managers of the mining companies.

Participant 1 said:

> When there is a legal issue at hand, since we represent the community, any compensation settlement for the community is dealt directly with the legal managers or officers of such companies and we engage with the legal heads of affected department.

IQ4 involved the exploration of the duty of organizational culture regarding GEPA mining regulations and standards. Participant 1 stated that the NGOs ensured that mining companies respected the communities' rights by having to seek consent from the communities before beginning their mining operations. The duty of organizational culture is to enforce and implement GEPA regulations and standards. The mining companies' failure to comply with GEPA regulations to ensure best practices made the common achievement of the organizational culture cumbersome.

According to Participant 2, most of the mining companies in Ghana were MNEs, so the NGOs compared the notes of such companies both in Ghana and abroad to ensure that they were protecting the environment. If they were not, pressure was put on mining managers to do the right thing. Participants 3, 4, and 5 agreed that most companies in the country were not developing a good organizational culture around GEPA mining regulations and standards. The enforcement and implementation of GEPA regulations and standards to ensure best practices were assumed to be adequately executed, but in reality, the opposite was occurring. GEPA core values from the national level to the district level were not being met. As a result, the lack of core values prevented companies from achieving the organizational culture needed to comply with GEPA regulations and standards.

Participant 6 noted that the NGOs reached out to different mining companies to discuss the need to protect the environment. The NGOs ensured that the mining industry sought proper consent from the mining companies before operating. Despite different concepts, the NGOs and the mining companies engaged in talks and educative channels to enforce GEPA regulations. Having a mutual understanding between community members and mining companies attracted more investors to the areas.

Participant 7 agreed that the role of organizational culture was to enforce the implementation of GEPA regulations and encourage mining companies to take greater responsibility for developing systemic approaches to regulatory challenges. This approach created best means and practices of identifying and managing risks. To what degree the responsibility would be realized in practice remains an open question.

According to Participant 8, to enforce the implementation of GEPA regulations and standards, mining companies were encouraged to take greater responsibility in developing their own systemic approach to regulatory challenges and to create best practices to identify and manage risks. However, the application of GEPA regulations to the multiple mining companies remains an open question. Participant 9 agreed that the organizational culture of mining institution played a role in the mining companies' ability to comply with GEPA regulations and standards. The organizational culture facilitates dialogue between companies and communities, in which criticism is accepted and remedial measures are taken.

IQ5 allowed the researcher to ask the participants about conflicts of interest among government officials, government regulators, mine owners, and mine managers. Participant 1 said, "There is conflict of interest as the mining communities see the GEPA regulations and standards being in bed with the mining companies because concerns raised by them, reported to the GEPA regulators are not well addressed to."

This made them wonder whether the GEPA regulations were for the communities or the mining companies. Community members were being educated more frequently, so they were able to use what little knowledge they had to refer to their rights on their farms and other properties whether they wanted mining activities, or not.

Another conflict of interest arose when community members believed that their members of parliament, opinion leaders, regulators, and traditional rulers were siding with the mining companies because these individuals had shares in the mining companies and were not enforcing adherence to GEPA regulations and standards.

Participant 2 stated that "there is conflict of interest since some community members who are benefits of the mining companies can convince other members to have the perception that, NGOs want to take advantage of them."

Some officials in one mining company told the community that its presence did not help in developing the community and that propaganda made it difficult to sensitize the community about GEPA regulations and standards in the mining industry. The difficulty in sensitizing the community about the need to adhere to GEPA regulations continues to be problematic, despite the role of NGOs role as an advocate for GEPA compliance in the mining industry.

Four categories identified the conflicts of interest that Participants 3, 4, and 5 agreed with:

1. Lack of communal purpose: There was no strong bond among government officials, government regulators, mine owners, and mine managers on becoming a team. This lack of cooperation reduced the development of a common agenda meant to protect the environment.
2. Corruption and greed: Mine managers extorted money from local citizens who were seeking employment with the companies, and government officials sent their own relatives to be employed. These acts compromised the regulators' role. The greedy nature of this structure resulted in compromising the supervisory role.
3. Lack of staff: There continue to be more unskilled staff working in the mining areas than experienced staff who understand GEPA regulations. Unskilled

staff work as interns or as workers are employed by the mine owners who need more training about complying with GEPA regulations. Unexperienced staff do not pay more attention to GEPA regulations and the consequences to society of nonadherence.

4. Government officials: Government officials are responsible for enforcing GEPA compliance by the owners of the mining companies operating in the country. In addition, government officials must ensure that when environmental regulations are not adhered to, they must report the violations. However, conflicts of interest between government officials and mine owners sometimes has resulted in the failure of adherence to GEPA regulations, making the task of accountability even more difficult. Some government officials have been unable to conduct their jobs effectively because of conflicts of interest that have resulted in harm to society and financial payoffs to the government officials.

Participant 6 said:

The conflict of interest is here because with the structure in the mining companies, there are government representatives involved in the board of directors, so for example, in AngloGold Ashanti Board, the director is appointed prior discussion with the Government, so when this happens and issues arises, the director naturally gets supports from the state and the government easily take sides with the mining company against the community and this makes it difficult for the GEPA regulations and standards to be enforced.

Participant 7 agreed that because of the friendly relationships that had developed between the regulators and the mining companies, public officials sometimes relaxed a little bit in their dealings with the mining companies regarding compliance. GEPA officials were feted with food, and their vehicles were fully fueled when they visited the mining areas to deal with regulatory compliance issues. Such actions diminished their sense of judgment toward the mining companies and made them less strict than they were supposed to be. This conflict of interest resulted in less adherence to compliance regulations.

According to Participant 8, the experience in Ghana illustrated how difficult it was to obtain compliance with mining regulations and standards. Some mine owners, managers, and government officials or regulators of the GEPA knew each other very well, making it difficult to enforce GEPA regulations and standards in the mining sector. This behavior has been routine in the mining sector, resulting in conflicts of interest that have limited GEPA compliance. As a result, mining companies failing to comply with GEPA regulations have faced fewer negative repercussions. Addressing conflicts of interest remains a serious problem because if issues are not recognized and controlled appropriately, they may undermine the fundamental integrity of officials, decisions, and agencies. Participant 9 concluded that there was collusion between the mining entities and the regulatory agencies, and vice versa. The mining companies reacted when regulators complained or tried to enforce GEPA regulations and standards. Shareholders may, or may not, have some direct role in the engagement of government officials.

IQ6 asked how domestic and international stakeholders could improve compliance with Ghanaian environmental regulations. In response to IQ6, Participant 1 expressed that community members were required to be informed whenever a mining company wanted to set up mining activities in that area. They also were supposed to be educated about environmental protection and ways that the licensing process was to be carried out before mining could begin. The lands belonged to the people, and they had rights over it, so when there was an issue in the community, they would be able to report it accordingly.

In addition, the GEPA, the Minerals Commission, and the NGOs were expected to collaborate to ensure and enforce compliance with GEPA regulations and standards. Again, dialogue among workers to be share ideas and resolutions was encouraged. Dialogue with the mining community helped them to learn more about the concerns of the mining companies and for them to offer their own recommendations to comply with GEPA regulations. Participant 2 indicated that domestic and international stakeholders could help to increase the authority of GEPA officers and add more staff if they were understaffed. In addition, the Minerals Commission and water resources had to have the necessary equipment, including cars for monitoring, air quality meters, and enough fuel to do the job at hand.

Domestic and international stakeholders were expected to put pressure on regulators to ensure that when issues were reported, they could be followed up and rectified as soon as possible. Participants 3, 4, and 5 agreed that domestic and international stakeholders could help to improve compliance with GEPA regulations by

taking the following steps:

1. Localizing implementation of international laws on human rights and security such as African Mining Visions and other International Environmental Protection treaties and protocols.
2. Decentralizing government regulatory agencies to enhance their proactiveness in ensuring GEPA compliance.
3. Ensuring strict compliance with the standards of the Organization for Economic Co-operation and Development because most of the mine owners were from different countries.
4. Addressing compliance issues by taking a more thorough approach, meaning that stronger local government systems could help to solve the problem.
5. Enhancing the visibility and accessibility of environmental impact assessment documents to improve the accountability of environmental protection agreements between government and mining companies.
6. Undertaking vigorous efforts to improve transparency because some contracts currently are awarded to government officials in the mines.

Participant 6 stated that domestic and international stakeholders could help to improve GEPA by clearly defining the role of government in regard to the mining companies. Government could still maintain its 10% stake without any political figures being on any boards of the mining companies. This restriction could help GEPA officers to enforce their regulations and standards without state interference, such as supporting the mining companies when issues arose.

According to Participant 7, domestic and international stakeholders could improve GEPA regulation compliance by ensuring that environmental organizations and institutions adhered to universal standards by enforcing the rules about mining activities. Some financial institutions, such as the African Development Bank, have environmental protection standards requiring that borrowers must comply with these standards. Adhering to this principle would be extremely useful.

The GEPA, Minerals Commission, and Forestry Commission should collaborate by sharing reports and notes, and addressing issues affecting the environment. Joint group interventions would help to improve the environment and the country at large. Public officials in the regulatory units should not be politically affiliated as one way of ensuring that they could do their jobs without undue influence. There should be the proper collection and storage of data regarding GEPA regulations in the mining sector without bias to ensure that every mining company follows GEPA regulations, regardless of political affiliation. Filling these gaps would help to ensure the efficient compliance with GEPA regulations and standards.

Participant 8 suggested several ways that domestic and international stakeholders could improve compliance with GEPA regulations:

1. Create a work environment that is attractive to mining activities and compliance with GEPA regulations.
2. Design and implement tools that promote environmentally responsible behaviors within the mining sector.
3. Involve more stakeholders in promoting compliance.

4. Support activities with environmental authorities, such as assessing the environmental significance of Ghanaian mining companies and training workers to accept and understand the challenges the regulations pose for mining managers and mining sectors.
5. Offer easy access to information, including online access to laws and regulations, analysis, and disclosure of information on environmental performance and the specific needs of Ghanaian mining enterprises.
6. Provide compliance assistance, and promote excellence, including the development of reference materials for mining institutions as well as support for environmental management systems and cleaner production.

Participant 9 asserted that ensuring that the NGOs served as independent referees to monitors the activities of domestic and international stakeholders would help them to ensure compliance with environmental regulations compliance in the mining sector. Participant 9 also mentioned instances when the vigilance of NGOs led to huge monetary settlements by the courts to communities that had suffered from the actions and inactions of these stakeholders.

The researcher asked IQ7 to explore deficiencies in the relationship between mine managers and government regulators. In response to IQ7, Participants 1 and 2 asserted that instead of government agencies playing supervisory role, they tended to back the mining companies whenever they committed offenses or did not follow GEPA regulations and standards. Community members, with the help of civil society organizations had to gather their own evidence against these mining companies because

the state agencies would not assist them.

Participants 3, 4, and 5 expressed similar views about a deficiency in the communication system such that there was no more transparency and that the monitoring of environmental impact assessments and its mitigation framework was lacking. Participant 6 indicated that government involvement in mining business hindered compliance with GEPA regulations and standards. This is because government officials and/or agencies sat on the boards of many of the mining companies.

The NGOs asserted that the GEPA was not producing reports that reflected the real situations on the ground and the real damage being done to the environment. The working relationship among the GEPA, Minerals Commission, and Forestry Commission was so poor that they did not share notes or information. As a result, when environmental issues came up, they could not be addressed appropriately. Some officials in these regulatory offices were politically affiliated, a situation that had an influence on the quality of their work. In addition, there were no efficient data management and record keeping to support cases that did not ensure efficient compliance.

Participants 8 and 9 concluded that there was a lack of transparency enforcing GEPA regulations in the mining sector because some mine managers and government regulators were friends or related by family ties. Mining managers lacked education about the importance of choosing transparency in enforcing GEPA regulations and standards over favoritism to make the entire Ghanaian community and mining areas safe from water and air pollution.

IQ7a was asked to explore the programs and practices that Ghanaian mine managers could adopt to improve environmental stewardship. In response to IQ7a, Participants 1 and 2 proposed that because most mining companies were not from Ghana, they cared more about profits than the safety of the Ghanaian environment. Mine managers were tasked with the responsibility of enforcing GEPA regulations and standards at the mining areas to protect the environment and ensure the safety of the people in Ghana, especially those living near the mining areas. Participants 3, 4, and 5 recommended that mine managers include communication about GEPA regulations in their activities and be transparent in disclosing their obligations and responsibilities to follow GEPA regulations and standards. Doing so would help to focus on GEPA regulation compliance and ensure that the environment was free from pollution issues.

Participant 6 suggested that development of an environmental management tool to rank the mining companies in terms of adherence to identified environmental social standards would help to improve daily supervision in the mining sector to ensure that GEPA regulations and standards are followed to keep communities safe and free from pollution issues. If this were to happen, mining companies would be graded according to their best performance on complying with EPA regulations and standards.

Participant 7 proposed that periodical visits to mining sites would ensure that no safety or environmental damage was occurring. Such issues would have to be addressed immediately, and the mining companies should be fined as one way to deter other mining companies from creating such damage themselves. To implement environment management plans, government departments in charge should have officers who are

competent and disciplined enough to manage any situations.

Participants 8 and 9 added that no one should be above the law regarding adherence to GEPA regulations and standards law to avoid charges of nepotism. All mine managers would have to abide by regulations and standards set by the GEPA. If mine managers or regulators failed to adhere to this practice, they would be held accountable. By so doing, these two parties would have to ensure that things are done right in ways that would keep the communities and mine workers safe. Finally, mine managers must be educated about the importance of choosing transparency in enforcing GEPA regulations and standards over favoritism to keep the entire Ghanaian community and mining areas safe from water and air pollution.

The researcher asked IQ8 to discover what other steps the Ghanaian government and the mine owners have taken against GEPA mining regulatory noncompliance in the industry. Participant 1 proposed that the government establish strict laws, such as enforcing mining communities to comply with the GEPA to benefit the country rather than attract more investors. The government must ensure that these laws are adhered to by the mining companies. With the ongoing sensitization in communities about compliance, community members would have the power to monitor and report the activities of the mining companies to ensure proper compliance.

Participant 2 noted that leaders such as chiefs, assembly members, opinion leaders, civil society organizations, members of parliament, and ministers must be aware of GEPA regulations and standards to avoid nepotism practices that could lead to conflicts of interest. The communities where mining activities take place also must be

sensitized so that they could monitor mining operations to ensure compliance with GEPA regulations and standards.

Participants 3, 4, and 5 recommended lawful reforms and court actions to curb noncompliance issues in the mining sector. As mentioned earlier, some farmers had been compensated by the mining companies for damage to their farmland. Legal reforms have seen some amendments of the Mining and Mineral Act and an expansion of the number of working days from 14 to 21 for community members to submit petitions for or against the GEPA granting permits for mining-related projects.

Participant 6 was of the opinion that it would be in the best interests of community members and active leaders or stakeholders to form advocacy groups and educate themselves more about environmental issues. They also should have leaders who are educated and knowledgeable about environmental issues, capable of reporting and standing up for them in cases of environmental pollution. Laws governing the mining sector also should be implemented so that culprits could be punished accordingly.

Participant 7 asserted that the government should recruit technical people who could visit the mining sites to ensure compliance with GEPA regulations. Participant 7 added that legal reforms and court actions must be enforced to reduce the incidence of noncompliance in the mining sector. The government also must continue to alert mining companies of the possibility of losing their licenses if they failed to comply with GEPA regulations and standards.

Participant 9 concluded that the national and international judicial apparatus should hold shareholders in mining companies to account for any negative impact of

mining activities on the environment. This action would put mine owners, mine managers, and shareholders in the mining industry on notice that they must adhere to GEPA regulations and standards. In addition, laws governing the mining sector should be used to charge offenders responsible for polluting the environment. Overall, the NGO participants responded openly and fully to the interview questions related to their knowledge of enhancing compliance with GEPA regulations and standards in the Ghanaian mining industry.

Summary

The purpose of the study was to explore the perceptions of NGO stakeholders of the challenges faced by managers in the Ghanaian mining industry tasked with GEPA compliance. To conduct this exploratory study, the researcher took a qualitative case study approach (Smith, 2015). To better understand the perspectives of the participants, all of whom had experience in the Ghanaian mining industry, the semistructured interviews were examined using thematic analysis. This analysis yielded four major themes.

The themes suggested that the NGOs had limited effectiveness in pressuring the mining companies to comply with GEPA regulations. These NGOs did not engage directly with the companies. Much of the work that the NGOs conducted was with the public because the mining companies were not always willing to cooperate with the NGOs. Although the NGOs could use a variety of strategies to pressure the companies to adhere to GEPA, various stakeholders lobbied in favor of the mining companies. Politicians, company investors, and even the media often supported the interests of the

companies rather than the concerns expressed by the NGOs. The implications of these findings are discussed in Chapter 5.

Chapter 5: Interpretation, Recommendations, and Conclusions

Introduction

As managers in the Ghanaian mining industry struggle to comply with GEPA regulations to reduce environmental pollution, it is important to recognize factors that may affect the success of future policies and implementation of GEPA regulations in the mining industry. The researcher collected data from nine individuals employed by NGOs focused on Ghanaian environmental issues. The purpose of the study was to explore the perceptions of NGO stakeholders of the challenges faced by managers in the Ghanaian mining industry tasked with complying with GEPA regulations. The review of the literature indicated that the Ghanaian mining industry has had a long history of helping to generate revenue for the country (Aragon &Rud, 2015; Hogarh et al., 2016). Unfortunately, this history has been accompanied by environmental violations associated with causing harm to surrounding communities (Hogarh et al., 2016; Snapir et al., 2017). As such, various stakeholders have begun to apply more pressure to force compliance with environmental regulations.

The researcher used a qualitative case study approach, which is appropriate for exploratory studies (Smith, 2015). Following a qualitative methodology allowed the researcher to identify commonalities across the participants' responses to the interview questions and produce themes that typified their experiences. Through the interview questions, the researcher explored the NGO participants' perceptions of the challenges faced by managers in the Ghanaian mining industry tasked with complying with GEPA

regulations and standards. Following a review of the qualitative data, the researcher identified four major themes:

1. NGO role as advisor.
2. Small, tight-knit community of officials.
3. Investment in mining companies.
4. Actual actions by NGOs.

Summary of Findings

Four comprehensive themes emerged from the data collection: (a) NGO role as advisor limited the ability of the NGOs to help mine managers to comply with GEPA regulations, (b) small, tight-knit community of government officials and senior mine managers created conflicts of interest, (c) investment in mining companies, and (d) actual actions by NGOs. The NGO participants provided responses to interview questions about their training experience in attempting to determine how to convince managers in the mining sector to comply with GEPA regulations. In addition, the NGO participants provided responses to question about their perceptions of the challenges facing Ghanaian mining managers to comply with GEPA regulations.

Twenty NGO participants were invited to join the study, and nine expressed interest in being in the study. NVivo software was used to analyze the data, and four comprehensive themes emerged from that analysis. All nine NGO participants provided insight to management in the mining sector in Ghana to understand the need to comply with GEPA environmental and regulatory policies. The NGO participants discussed the following topics, all of which led to the emergence of four themes in the study:

(a) NGOs' engagement with mine managers to comply with GEPA regulations, (b) shared information about conflicts of interest between public officials and mine managers that influenced implementation of GEPA regulations, (c) concerns of mining companies and public officials interested in making profits rather than complying with GEPA regulations to keep communities safe from pollution issue, and (d) action taken by the NGOs to encourage adherence to GEPA regulations. The four overarching themes are discussed further in the next section.

Interpretation of Findings

The study was guided by one RQ: What are the perceptions of NGO stakeholders of the challenges faced by managers tasked with GEPA compliance in the Ghanaian mining industry? The researcher sought to address the RQ by interviewing nine NGO stakeholders of the challenges faced by managers in the Ghanaian mining industry tasked with GEPA compliance. The participants had to have at least 3 years of experience with Ghanaian mining pollution regulation issues. A purposive sample of nine NGO employees focused on Ghanaian mining interests offered their insight into ways that the mining managers could comply with GEPA regulations and standards, followed by community involvement to promote the mining managers' compliance in the Ghanaian mining industry. Following is a discussion of the four themes that emerged from the data analysis.

Theme 1: NGO Role as Advisor

The researcher found that the NGOs played a role as advisor to representatives of the mining companies. These NGOs may, or may not, have worked directly with these

companies. Regardless, they provided support to the mining companies by helping them to access and review research reports that could be acted upon to improve operations and protect the environment. NGOs were more heavily focused on advocacy and attempted to engage with various stakeholders to improve environmental practices. Consequently, there were numerous actions that these NGOs could take an effort to improve environmental behaviors.

There was scant literature regarding NGOs and their advisory role. The results suggested that they did so by helping directly to pressure mining companies and by working within the communities, neither of which was mentioned in the literature. As such, the advisory role of NGOs adds to the extant knowledge.

Theme 2: Small, Tight-Knit Community of Officials

A point of concern raised during the interviews was the fact that many of the stakeholders in the mining industry had similar converging interests that made it difficult for the NGOs to improve the interactions between mining companies and the surrounding communities. The Minerals Commission was identified as one source that acted to protect the self-interests of the mining companies and their profits rather than the environment. Also noted were the many mine operators, managers, and even government officials who seemed more interested in maximizing the profitability of the mining companies than ensuring the safety of the communities and the environment.

The vested interests of various mining officials in ensuring the success of mining operations, even if they came with associated environmental costs, seemed to be consistent with the literature. Ghana had historically pursued mining as a way of

generating revenue for the economy (Aragon & Rud, 2015; Hogarh et al., 2016). Over time, profits have taken priority, with less attention being paid to enforcing regulations meant to benefit the surrounding communities and environment (Hogarh et al., 2016). The decline in environmental health has had detrimental consequences for communities, particularly those in close proximity to the mines. As such, the findings of the current study suggest that mining operations continue to benefit from officials who are more invested in the success of those operations rather than in the enforcement of environmental regulations.

Theme 3: Investment in Mining Companies

The third major theme of the study was partly linked to the concerns expressed by the participants about the small groups of public officials who were influential in Ghanaian mining operations and who were primarily interested in maximizing the profits of those operations. The participants suggested that the way the current investment structure was set up diverted funds to companies that abused those funds without creating the kind of return on investment that was expected. These companies may have stated that they were investing certain amounts of money to benefit the country, but this lie was nothing more than a public relations exercise that did not show any evidence that such actions had been taken.

The finding that there was a vested interest in maintaining the status quo of mining operations seemed consisted with the idea that the mining operations were of great value to the country. The Ghanaian mining industry produces gold using modern automated processes that derive revenue for the companies and income for the country

(Aragon & Rud, 2015). The value of these operations had led to a rapid expansion of gold mining operations across Ghana (Snapir et al., 2017). Historically, these companies have had little incentive to prioritize the environment, leading to a decline in agricultural productivity (Aragon & Rud, 2015) and poor, if any, enforcement of mining policies and laws (Hogarh et al., 2016). The results indicated that the same conditions continue to prevail, with the success of mining operations being promoted by multiple national interests at the expense of the surrounding communities and the environment.

Theme 4: Actual Actions by NGOs

Theme 4 suggested that the range of actions that the NGOs took to encourage greater care of the environment and the lives of Ghanaians were vast. The NGOs helped to encourage greater engagement with the environment and the care of Ghanaians by reaching out to the communities directly. The NGOs have helped to raise awareness at the community level regarding mining operations and their detrimental impact while also attempting to demonstrate how communities could pressure mining companies to release environmental reports and be transparent in their operations.

The broad range of actions taken by the NGOs in Ghana was not explored in the literature. Instead, the various strategies and approaches used by the NGOs to gain compliance from mining companies with environmental regulations were uniquely present in the current study. As such, the actions of the NGOs in response to the lax regulatory actions of mining operations will become a unique addition to the research literature. The study, therefore, has done more than align with the previously existing literature; it also has made an important contribution to the extant knowledge.

Limitations of the Study

One limitation of the study was the potential for participant bias. During the study, that participants could have answered the interview questions with responses that they felt that the researcher wanted. Bias in favor of the researcher's expectations could have led to false responses resulting in inaccurate portrayals of the experiences of these individuals. To minimize the chance of bias, the researcher minimized engagement with the participants during the interviews.

There also was the chance that the participants could have given answers to the interview questions that favored the researcher or their own respective organizations because they feared how they would be portrayed in the final report. The participants were assured that their answers would remain confidential and that their identities would remain anonymous. No responses would be linked to any specific participants in the hope that the participants would provide responses that were not biased by pressure from the researcher or their own organizations. The researcher provided only a minimum amount of guidance when clarification was necessary to move the interviews forward or to clarify specific points to improve the participants' understanding of the questions.

The small sample size also limited the generalizability of the findings. A small sample is typically nonrepresentative of the target population, so the responses may be heavily weighted in favor of a segment of the target population rather than characteristic of the whole. The small sample also was threatened by the limited geography from which the participants were drawn, an issue that could have introduced the possibility of the responses being influenced by regional influences.

Qualitative studies generate a large amount of information from small numbers of participants. However, using a larger sample to obtain the data for this study would have exceeded the resources of the researcher. Even though the generalizability of the findings may be limited, the qualitative data that were obtained may form the basis from which larger qualitative studies may be conducted.

Recommendations for Action

Notwithstanding the sustainability efforts of small groups of government officials and senior mine managers in Ghana's mining industry, mining activities can promote profitability and decrease environmental pollution. The result of the study will be beneficial to mine owners, mine managers, and shareholders in the mining industry. The results may encourage the aforementioned stakeholders to adopt best practices to improve compliance with GEPA compliances. The findings also may help GEPA regulators or policymakers to address ongoing environmental pollution issues associated with mining activities in Ghana to improve mining operations and protect the environment.

Based on the findings of the four critical themes, the researcher recommends that mining operations, national stakeholders, and NGOs collaborate to resolve the issues facing the Ghanaian mining industry. Each party has invested interests in the outcomes of mining operations that affect how they address the current state of mining in the country. Some stakeholders are more heavily concerned about the profitability of their mining operations, whereas others might be more interested in protecting the surrounding communities and the environment.

Another recommendation is to resolve these issues in ways that may require that the parties work together to address concerns and achieve mutually desirable outcomes concerning the mining industry and its operations in Ghana. Yet another recommendation is to have the small group of government officials and senior mine managers in the Ghanaian mining industry comply with GEPA regulations to protect the environment and improve mining operations. Doing so might maximize business benefits and ensure the safety of the communities and the environment.

The final recommendation is that the NGOs continue to embrace the grassroots advocacy on behalf of the communities to improve mining operations and protect the environment. The NGOs may pressure the government to introduce lawful reforms and court actions to curb noncompliance issues in the Ghanaian mining industry. Mining companies should intensify mine managers' training and awareness of the need for transparency in enforcing GEPA regulations and standards over favoritism to keep Ghanaian mining activities and local communities safe from pollution.

Recommendations for Further Study

Qualitative studies such as this one have limited generalizability, even if it provides insights into a phenomenon owing to the depth of the data collected. The lack of testable variables limited the degree to which the findings could be generalized to other contexts or even to other nations and the NGOs working in them. The study was limited to NGO stakeholders' perceptions of the challenges faced by managers in the Ghanaian mining industry tasked with complying with GEPA regulations. A limitation of this study

was the sample size of nine NGO participants. A future study with a larger sample size may generate more useful information.

Future researchers could build on the current study by identifying the concepts expressed in this qualitative study and operationalize the results as testable variables. These variables could then be applied in a quantitative survey gauging the relationship between NGOs and Ghanaian mining operations. In such a study, a larger, more representative sample could be generated, and surveys could be distributed to obtain the data. These surveys would facilitate the use of a larger sample because they could be distributed across a larger target population more easily. The findings would have more generalizability that would be applicable across the target population.

Other kinds of quantitative studies also could be conducted. Researchers could examine the profits of mining operations during periods when news of their operations was negative to identify possible connections between negative news and mining profits. If negative news and decreased profits are associated, they could present an objective metric indicating why mining operations should comply with NGOs and environmental regulations.

Implications

The study has many social implications. First, the cumulative information obtained from the literature review and the interviews suggest that mining operations in Ghana tend to take priority over compliance with environmental regulations. Second, this prioritization of mining operations is the result of a national investment in mining operations characterized by highly placed stakeholders, new organizations, and the

mining operations themselves all working to prioritize the success of these operations rather than comply with GEPA regulations. The implication of this prioritization of mining operations is that the health of the communities and the environment continues to be at risk.

A final takeaway from these findings is that greater attention needs to be paid to the ways in which mining operations are conducted. These operations do not receive appropriate oversight from regulators, thus placing communities and the environment at risk. As such, from the perspective of the participants, it is important that the mining industry in Ghana be overhauled. The findings may help to inform future policies and support the efforts of mine managers to implement GEPA regulations in the Ghanaian mining industry. The findings also might contribute to positive social change by expanding mine managers' knowledge and understanding of their role in ensuring compliance with GEPA regulations in the mining industry.

Conclusion

The purpose of the study was to explore the perceptions of NGO stakeholders of the challenges faced by managers in the Ghanaian mining industry tasked with complying with GEPA regulations. To conduct the study, a qualitative case study approach was chosen that included the collection of interview data and a thematic analysis of the data. Four themes emerged from the study: (a) NGO role as advisor; (b) small, tight-knit community of officials; (c) investment in mining companies; and (d) actual actions by NGOs. The results indicated that the participants believed that national interests, including those of highly placed officials, prioritized the operations of mining operations

over the safety of communities and protection of the environment. The NGO participants pointed to legal reform, court actions, transparency, and the training of mine managers as factors that would promote compliance with GEPA regulations in the Ghanaian mining industry. The sample of nine NGO employees, all of whom had at least 3 years of experience in the Ghanaian mining industry, provided responses that helped the researcher to explore and describe approaches to promoting compliance with GEPA regulations in the mining sector. All of the NGO participants indicated that mine managers' compliance with GEPA regulations in the Ghanaian mining sector had business importance and benefits that would keep communities safe and free from pollution issues. Even though the qualitative nature of the study limited the generalizability of the results, the study could serve as the foundation of future qualitative investigations. Such an approach may produce more widely generalizable data that could be used to typify the experiences of various stakeholders in the mining industry in more detail.

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Appendix: Interview Questions

Demographics

Age:

Education:

Title:

NGO name:

Years of experience with Ghana environmental issues:

How large is your NGO:

Interview Questions

1. What resources does your NGO provide to mining managers in Ghana to comply with GEPA regulations?
2. How do you interact with Ghanaian mine managers regarding environmental stewardship?
3. How do you interact with Ghanaian mine owners regarding mining and environmental stewardship and GEPA regulatory compliance?
4. What is the duty of organizational culture regarding GEPA mining regulations and standards?
5. What conflicts of interest exist among government officials, government regulators, mine owners, and mine managers?
6. How can domestic and international stakeholders improve Ghanaian environmental regulation compliance?

7. What deficiencies exist in the relationship between mine managers and government regulators?
    a. What programs and practices can Ghanaian mine managers adopt to improve environmental stewardship?
8. What further steps have the Ghana government and the mine owners taken against GEPA mining regulatory noncompliance in the industry?