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From Nationalization to Liberalization: How Mining Sector Reforms Weakened Environmental Protection in Ghana

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ABSTRACT

Mining and environmental laws regulate environmental protection in the mining sector. Many governments of developing countries liberalized their mining sector in the 1980s to create enabling conditions to attract foreign investment into the mining sector. Although the mining sector liberalization policy revitalized Ghana's economy, it paid less attention to environmental legislation. We assessed whether Ghana's mining sector liberalization has deregulated the mining and environmental laws to attract FDI. The study used mixed-method that combines qualitative and quantitative methods. We rely on survey data from 384 respondents, 64 from each of six strata, and qualitative data from 41 interviewees and 42 focus group participants, six in each of seven groups. Descriptive statistics, such as percentages and cross-tabulation and inferential statistics, such as analysis of variance (ANOVA) and Spearman's rank correlation analysis were used to analyze survey data. Qualitative data was analyzed using NVivo. Spearman's rank correlation analysis results ($r = 0.833$ and p-value = 0.000) revealed that, a strong positive relationship exists between mining sector liberalization and weaknesses in the mining and environmental laws at a 99.9% confidence level. This indicates that Ghana's mining sector liberalization in the 1980s has led to deregulation and weakening of its mining and environmental laws. The country's environmental standards have failed to include specifics to deal with the externalities of mining activities. Further, these laws do not included clauses to prohibit mining activities that are inimical to the environment. Many interviewees and focus group participants supported these views.

INTRODUCTION

Environmental legislation is the set of laws that govern environmental protection in the mining sector. These laws include environmental regulations within minerals and mining laws and national environmental laws applicable to the mining industry (NRGI, 2015). Environmental regulations, on the other hand, are the rules governing mining and environmental laws. They are tied to these laws and provide significantly more detail (NRGI, 2015; African Mining Legislation Atlas (AMLA), 2017). The World Bank (2013, p. 12) argues that, in most cases, mining laws and regulations govern environmental matters related to mining. AMLA (2017) confirms this, stating that environmental legislation and regulations address the environmental impacts of mining operations. Ghana adopted the International Monetary Fund (IMF) and World Bank structural adjustment programs (SAPs) in 1983. It liberalized its mining sector in 1986 to attract investors and revitalize its economy. The liberalized economy has attracted significant investment in Ghana's mining sector (World Bank, 1992, cited in UNDP-Ghana, 2015, p. 16). While it is almost indisputable that liberalization has attracted foreign direct investment in the mining industry, the impact of this liberal policy regime on the content of the mining laws and environmental laws applicable to the mining industry in Ghana is concerning (Awudi, 2002, p. 2; UNDP-Ghana, 2015, p. 16). Various authors have linked Ghana's weak mining and environmental laws to the liberalization of the mining sector (Akabzaa, 2000; Akabzaa & Darimani, 2001; Aubynn, 2017; Tuokuu, 2019). However, there is little mixed-methods research examining the relationship between mining liberalization and weak environmental regulation in Ghana. To help fill this gap, this study used a mixed-methods design combining qualitative and quantitative methods to determine whether Ghana's mining liberalization has led to the deregulation of mining and environmental laws. The thrust of this study is to examine whether Ghana's mining and environmental laws' deregulation and weaknesses are due to the mining sector liberalization.

LITERATURE REVIEW

Ghana's Minerals and Mining Policy, Immediately after Independence, 1957-1986

President Nkrumah nationalized the economy after Ghana gained independence in 1957 to generate income for rebuilding and maintaining the newly independent state and to create employment for the citizens (Tsuma, 2010; UNDP-Ghana, 2015). The policy created state-owned enterprises and nationalized existing mining companies, except for Ashanti Gold. The nationalization created a lack of investor confidence in Ghana's new economy and undermined the necessary competition for developing

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Ghana's mining sector (Tuokuu, 2019). The World Bank (1992) believed that nationalization forced many local and foreign mining companies out of business, crippling Ghana's mining sector. Despite the nationalization, the state lacked the requisite technical and managerial skills to implement this policy effectively (Jedwab & Osei, 2012).

To enforce the nationalization policy, the Parliament of the First Republic of Ghana passed the Minerals Act (Act 126) in 1962. The Minerals Act regulated and guided the implementation of the nationalization policy from the 1960s to the mid-1980s. This Minerals Act strengthened state control over the mining sector and prohibited potential foreign investment in it (Parliament of the Republic of Ghana, 1962). The Minerals Act of 1962, however, did not regulate pollution or protect the environment. There were also no specific environmental laws to prevent mining activities from causing environmental degradation (Akabzaa & Darimani, 2001). However, environmental degradation in the mining sector during this period was less pronounced. The mining sector's nationalization policy did not allow environmentally destructive techniques such as surface mining and heap leaching. During the period, mining companies engaged in deep underground mining, removing a minimal amount of overburden to gain access to the ore deposit (Environmental Law Alliance Worldwide (ELAW), 2010).

In surface mining, however, companies must first remove the vegetative cover, which entails felling trees and either clearing or burning vegetation before removing the top layer of soil to reach the ore deposit. In this case, miners used heavy machinery, such as bulldozers and dump trucks, to remove the overburden (Environmental Law Alliance Worldwide, 2010). Surface mining, therefore, is more environmentally unfriendly and one of the most environmentally destructive mining techniques. Conversely, underground mining is environmentally friendly, keeping much of the land surface intact and allowing mining activities to coexist with agriculture, forestry, and human settlements (Agbesinyale, 2003; Awudi, 2002).

The Overseas Development Institute (1996) noted that, following the 1966 coup d'état that removed President Nkrumah from office, the Ghanaian economy stagnated and living standards declined. Public investment in the import–substitution industries and infrastructure was yielding low returns. Furthermore, the series of coups in Ghana in the 1970s, and the subsequent establishment of governments with personnel who lacked the requisite expertise in economic and political management, led to an economic downturn (Aubyn, 2017). Moreover, the global debt crisis of the 1980s worsened Ghana's economic problems, and by the mid-1980s, the country's economy was in recession (Aubynn, 2017). The average annual GDP growth rate between 1975 and 1983 was −3%, while the per capita GDP growth rate was −7% (Aubynn, 2017). The annual average growth rate of agriculture between 1970 and 1983 was −5%, and the gross domestic investment fell to −5.9%. Annual average growth rates of exports, imports, and trade terms between 1970 and 1983 declined by −4.4%, −7.2%, and −1.3%, respectively (Overseas Development Institute, 1996).

A combination of Ghana's nationalization policy, the lack of investor confidence, capital shortages, and technical and managerial skills, and the 1980s global debt crisis led to an economic downturn that affected the mining sector (World Bank, 1992; Campbell, 2010; Tuokuu, 2019). Mining output decreased drastically after independence, with gold production declining the most, from a peak of 915,317 ounces in 1960 to 287,124 ounces in 1986 (Amponsah-Tawiah & Dartey-Baah, 2011). Diamond production declined from 1,138,665 carats in 1960 to 560,538 carats in 1986 (Akabzaa & Darimani, 2001). Describing the situation, Aryee (2001, p. 62) observed that no new mine opened in Ghana during the three decades up to the 1980s because the economic, financial, industrial, and legal framework in which the mining sector operated caused so many problems for current and potential investors.

Structural Adjustment Programs, Mining Sector Liberalization and Environmental Standards

Ghana's mining industry was liberalized as a result of the deployment of SAP in developing countries in the 1980s. The World Bank played an active role in this process (Hogan, 2010). Watkins (1995) noted that SAPs had to address immediate symptoms of the debt crises and initiate broad policy reforms. SAPs consequently prescribed conditionality clauses accompanied by IMF and World Bank loans. These conditionality clauses originated in the central principles of neoliberalism: deregulation, economic stabilization, liberalization, and privatization (Birch & Mykhnenko, 2009; Sulaiman et al., 2014; United Nations, 2017). Often, these SAPs saw the mining sector's liberalization as pivotal for revitalizing a country's economy. Thomson et al. (2017, p. 3) noted that liberalization entails measures to facilitate the free flow of trade and foreign investment, such as revising policies and removing tariffs. These liberalizing policies created an enabling environment and attracted foreign direct investment (FDI) (World Bank, 1992, as cited in UNDP-Ghana, 2015).

According to Ou (2011), one of the most important tools governments have utilized under SAPs to attract FDI is environmental regulation. Yoon and Hashmati (2017) assert that discrepancies in the environmental cost of production between countries are sufficient stimuli for industries to relocate their products and production processes. For instance, Aliyu & Ismalia (2015) argued that differences in environmental stringency and its associated costs between African countries and foreign investors have contributed to the relocation of environmentally unfriendly industries to Africa. Scholars argue that many developing countries deregulated their environmental standards to gain a comparative advantage to attract multinational corporations (MNCs) (Temurshoev,

2006; Kilicarslan & Dumrul, 2017; Gill *et al.,* 2018). Deregulation refers to the removal or relaxation of government regulations in a particular industry or sector (Jhang, 2018).

Nasrollahi *et al.* (2014) investigated whether investors favor lax environmental regulation when making FDI location decisions. They used panel data of FDI inflows in five Asian countries from 1990 to 2011. Their findings revealed that investors favor weak environmental governance when deciding to locate FDI. Leslie (2016) and Aliyu & Ismail (2015) concluded that less stringent environmental regulations had attracted foreign investments to relocate to developing countries. Several other studies found similar results (Kellenberg, 2009; Poelhekke & van der Ploeg, 2012; Yoon & Heshmati, 2017; Solarin *et al.,* 2017).

Ghana adopted mining-sector liberalization in 1986 under the IMF and World Bank SAPs due to the failure of the nationalization policy, which, along with import-substitution industrialization, caused economic difficulties (UNDP-Ghana, 2015; Tuokuu, 2019). The liberalization policy focused on attracting FDI by privatizing state-owned companies and removing tariffs (Birch & Mykhnenko, 2008; Sulaiman *et al.,* 2014; UN, 2017). This policy approach has governed Ghana's mining sector from the mid-1980s to date, but at different levels. Although the mining sector liberalization policy revitalized Ghana's economy in the mid-1980s, it paid less attention to environmental protection (Awudi, 2002; UNDP-Ghana, 2015).

Evolution of Ghana's Environmental Policies Under the 1986 Minerals and Mining Law

The development of environmental policies applicable to the mining sector in Ghana developed slowly. The Environmental Protection Council (EPC), established in 1974, began utilizing EIA in 1989 as a means of managing the environment and as a requirement for all development projects, with a specific focus on mining projects (Akabzaa & Darimani, 2001). Nevertheless, the government's delay in enacting legislation to provide legal backing for the EPC denied the council the authority to require mining companies to conduct Environmental Impact Assessments (EIAs) on a mandatory basis. This authority denial had hindered the effective implementation and enforcement of the EIA in addressing environmental pollution in the mining industry. Akabzaa (2000) observed that a commission the government entrusted with assessing Ghana's environmental impact of mining in 1990 revealed that mining and mineral processing from 1986 to 1990 grievously impacted the environment (Akabzaa & Darimani, 2001).

The government also prepared and adopted the National Environmental Action Plan and the National Environmental Policy (NEP) in 1991. The action plan was a strategy for the government to address important issues such as environmental assessment and strengthening institutions to protect the environment and improve natural resource management (Appiah & Osman, 2014). The NEP provided a broad framework for implementing the National Environmental Action Plan and sought to assess all projects, including mining, that may negatively affect the environment. This assessment informed the NEP to set and implement suitable quality standards to ensure acceptable environmental quality and public health. In 1994, the government published the Mining and Environmental Guidelines to address the environmental impacts of mining (Akabzaa, 2000).

The Environmental Protection Agency (EPA) Act (1994) transformed the EPC into the EPA and redefined its functions as a regulatory body with legal authority to uphold and enforce environmental standards. The EPA Act made EIA and Environmental Management Program (EMP) the primary tools for managing environmental fallouts of natural resource exploitation and as a prerequisite for obtaining an environmental permit (Akabzaa & Darimani, 2001). Under the EPA Act, mining companies in Ghana must register with the EPA and obtain an environmental permit before commencing any activity or project (Akafia et al., 2017). The EIA helped evaluate and predict the project's potential environmental impacts. The EMP described measures and procedures for monitoring and mitigating the negative environmental impacts (Baby, 2011; Bhatt, 2023). For effective implementation, mining companies usually integrate the EMP into the EIA to ensure the EIA efficiently covers all its stages and functions (Bastida, 2002).

The EPA Act of 1994 also required the mines to submit their environmental monitoring programs, including environmental action plans, annual environmental reports, and environmental audit reports (EAR), to the EPA (Akabzaa, 2000). These periodic assessments enabled the mines to tackle environmental issues arising from their activities. These practices helped mining companies to build preventive and mitigation measures into their activities to protect the environment. Furthermore, the enactment of the 1994 EPA Act gave rise to the 1999 Environmental Assessment Regulations (LI 1652). This regulatory instrument prescribes the procedure for acquiring and maintaining environmental permits (LEX Africa, 2019; Tuokuu, 2019).

Difficulties in Enforcing Environmental Standards and Regulations

These environmental standards and legislations faced several challenges. Firstly, there was a lack of human resources and equipment to perform the required duties (UNDP-Ghana, 2015). Akabzaa & Darimani (2001) observed that by the close of 1999, the EPA's nationwide staff was around 200. By 2000, the agency had just one legal officer to deal with emerging environmental issues. Moreover, the Tarkwa district office, the only EPA district office in the country, had only one officer. Secondly, there was a lack of collaboration and coordination between the EPA and the Inspectorate Division of the Minerals Commission of Ghana. Aubynn (2017) referred to the

institutional conflict between the EPA and the Inspectorate Division of the Minerals Commission over the material used to line the tailings dam. The two institutions have the ultimate authority to regulate the construction of the tailings dam. Each institution claimed the authority and prescribed a different material for lining the dam. This confusion and uncertainty created an opportunity for companies to use unsuitable material for this lining, leading to poisonous contaminants flowing from the dam and polluting the environment, thereby defeating the lining's very purpose of preventing contamination (Akayuli *et al.,* 2013).

The third challenge was the confidentiality clause in the 1986 Minerals and Mining law for an annual environmental audit report. The Ghanaian environmental audit guidelines relating to the mining sector further gave the mining company the right to accept or reject the audit recommendations' mitigation measures' shortfalls (Akabza, 2000; Akabzaa & Darimani, 2001). Accordingly, the audit report's confidentiality and the provision in its optional guidelines for accepting or rejecting this report's recommendation did not encourage mining companies to ensure environmental quality under the 1986 mining law. Finally, the mining companies in Ghana have reduced public hearings to discussions on job opportunities and the project's economic benefits to the state and the local people. These companies have failed to discuss the potential environmental impacts and the proposed mitigation measures with the mining communities (UNDP-Ghana, 2015).

MATERIALS AND METHODS

Study area

The study area is Tarkwa-Nsuaem Municipality, one of the 22 administrative metropolitan, municipal, and district assemblies within the western region, out of 254 of these in Ghana (Republic of Ghana, 2019, p. 4). The Tarkwa-Nsuaem Municipality is located in the south-eastern part of the Western Region of Ghana as shown in Figures 1 and 2, with a total land area of 978.26 km2 and has Tarkwa as its capital. The "municipality's land area represents 0.37% of the total land surface of Ghana" (Ghana Statistical Service, 2014, p. 1). Figure 2 shows the municipality's location between latitudes 4° N and 5° 40' N and longitudes 1° 45'W and 2° 10'W. The government of Ghana created this municipality from the former Wassa West District under Legislative Instrument (LI) 1886 in 2007 (Ghana Statistical Service, 2014, p. 1). "It shares boundaries with Prestea Huni-Valley to the north, Nzema East Municipality to the west, Ahanta West Municipality in the south, and Mpohor District Assembly to the east" (Republic of Ghana, 2019, p. 4).

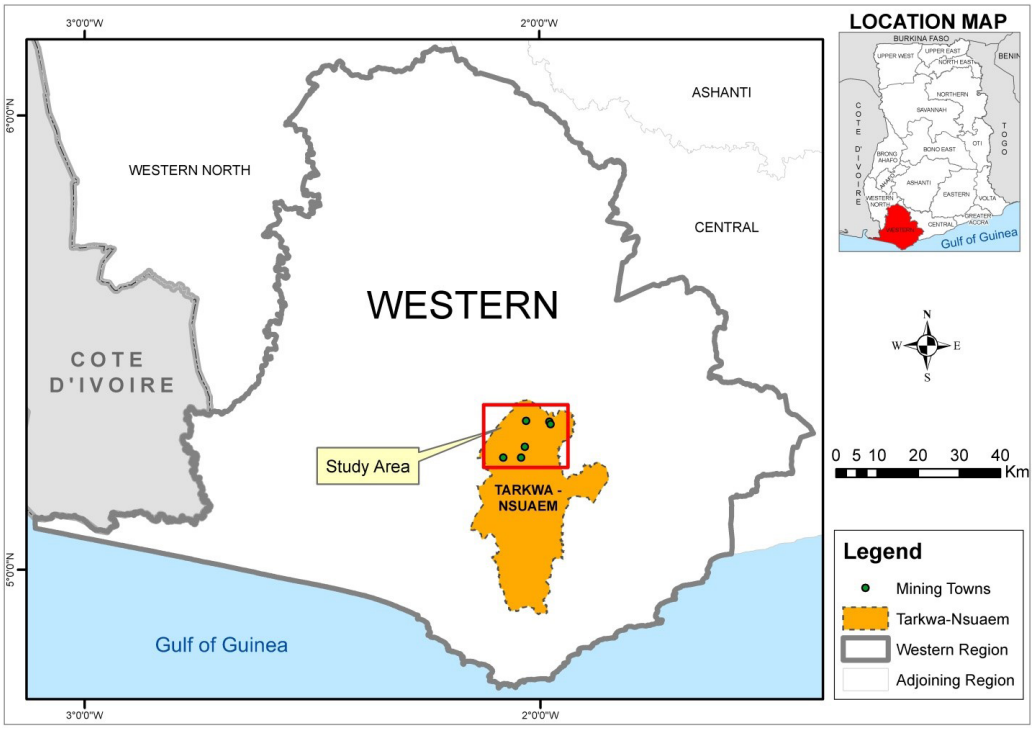

Figure 1: Map of Western Region Showing Tarkwa-Nsuaem Municipality
Source: Centre for Remote Sensing and Geographic Information Service, University of Ghana (2025)

The Ghana Population and Housing Census revealed that the population of Tarkwa-Nsuaem Municipality was 90 477 in 2010 (Ghana Statistical Service 2014, p. ix). The population increased to 181 224 in 2019, driven by an annual growth rate of 2.4%, comprising 49% females and 51% males. The gender ratio has deviated from the trend in Ghana of 51% females and 49% males (Republic of Ghana 2019, p.4). This demographic structure is accounted for mainly by the in-migration of economically active people, especially males, over the years to engage

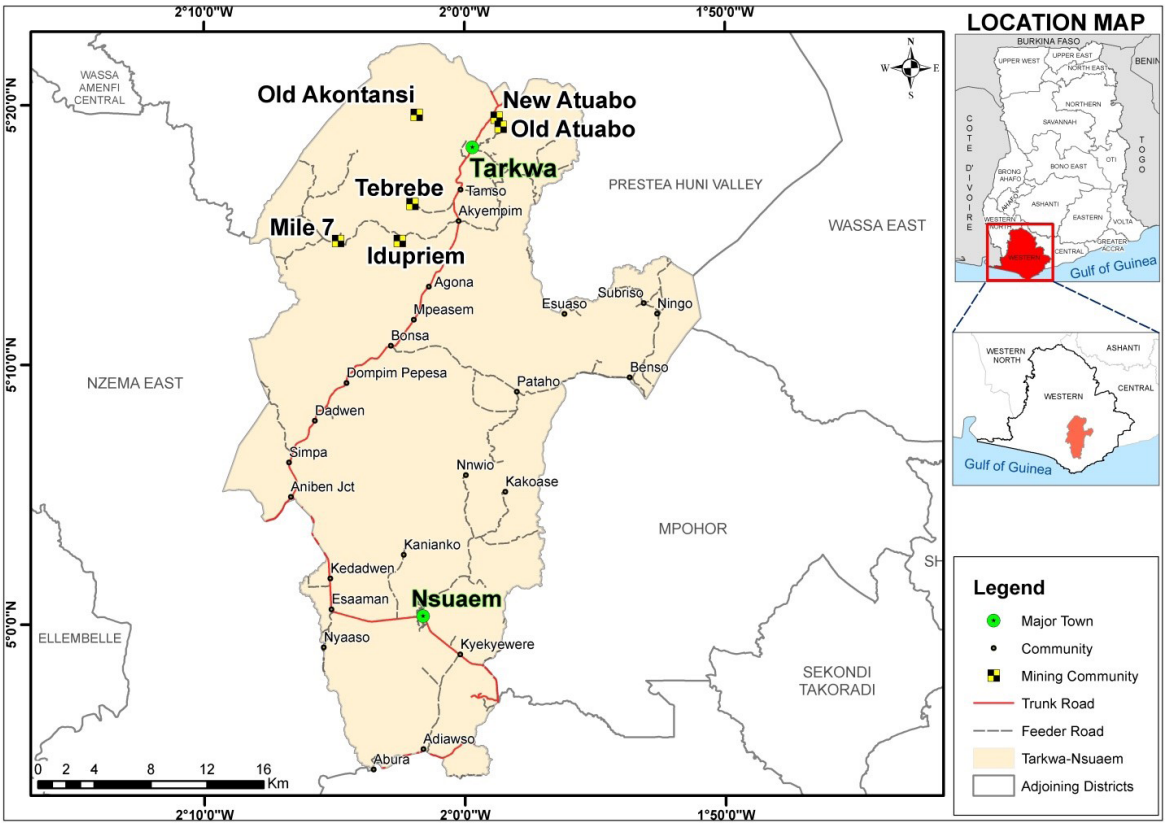

Figure 1: Map of Tarkwa-Nsuaem Municipality showing mining communities
Source: Centre for Remote Sensing and Geographic Information Service, University of Ghana (2025)

in both legal and illegal small-scale mining activities and other trades related to mining. The percentage of in-migrants in the municipality, mainly economically active force, was 44.9%, almost half of the total population (Ghana Statistical Service, 2014, p.23; Republic of Ghana, 2019, p. 4).

The Tarkwa-Nsuaem Municipality falls within the south-western equatorial climate zone of Ghana. Therefore, the municipality lies within Ghana's region with the highest rainfall, characterised by two peak periods and an average yearly rainfall of 1 500 mm. The main period of rainfall happens from March through June, with a secondary rainy season occurring from September to November (Ghana Statistical Service, 2014, p. 1). The rainfall exhibits a unique pattern in that it usually falls at 14:00. Thus, the municipality earned the nickname Tarkwa at 2 (Ghana Statistical Service, 2014, p. 1). The municipality experiences consistent high humidity levels, ranging from 75% to 78% during the wet season and between 70% and 80% in the dry season. Arid conditions result from north–east trade winds that blow over the area between November and February. For most of the year, the average sunshine duration for the municipality is seven hours. Relatively uniform mean monthly temperatures are recorded, ranging between 26 °C in August and 30 °C in March, with an annual range between 2 °C and 4 °C (Agbesinyale, 2003, p. 175; Ghana Statistical Service 2014, p. 1).

The Tarkwa-Nsuaem Municipality is an industrial mining hub of various activities. These activities include large-scale and small-scale mining, supporting services, and industrial laboratory services. The municipality is endowed with massive deposits of gold, manganese, and economically viable diamonds (Agbesinyale, 2003, p.185). Three large-scale mining companies, the highest number for a district out of 15 operating in Ghana, are located in the municipality (Ghana Ministry of Finance, 2018, p. 30). These three large-scale mining companies, AngloGold Ashanti (Iduapriem), Goldfields Ghana Ltd (Tarkwa), and Ghana Manganese Company (Nsuta) – the only manganese mine in Ghana – are all engaged in open-pit mining, which are destroying the environment (Agbesinyale, 2003, p. 185). Furthermore, there are 256 registered small-scale gold and diamond mining companies, with an estimated 50 000 unregistered small-scale miners within the municipality (Addai & Baiden, 2014, p. 74). These unregistered small-scale miners, known as *galamsey* operators, are dotted all over the municipality, with detrimental impacts on the environment. This municipality has been the most heavily mined area of the country, with about a century of mining in Ghana (Agbesinyale, 2003).

Research methods and data collections

The population for the study consists of mining community members, employees of civil society organizations, small-scale miners, civil servants, officials and employees of mining companies, and students and

lecturers at the University of Mines and Technology (UMaT). The researcher based the selection of these six categories of respondents constituting the target population on the place of work. This is because people from different workplaces have different knowledge and perceptions about the issues studied. The study used disproportionate stratified random sampling involving equal allocation (Daniel, 2011) in selecting 64 respondents from each category (strata), totaling 384 respondents. These respondents were selected from all the mining communities located on the map in Figure 2. This selection maximized the subsample size for each stratum for the study of the characteristics of each stratum with great representativeness and precision, making for a more balanced comparative analysis across strata (Daniel, 2011). The researcher administered questionnaires to 384 participants; of these, 372 responded; thus, 372 responses were analyzed. Further, 41 interviewees from diverse backgrounds related to mining and the environment in the municipality participated in the semi-structured interviews. In contrast, 42 participants, six in each of the seven focus groups used in the study, participated in the focus group discussion. In sampling interviews and focus group participants, the research team concentrated on six settlements where mining operations have been ongoing and mining problems were severe. However, a sizeable area of the municipality was mined for gold (Afriyie, Ganle, & Adamako, 2016). These mining communities were Teberebie, Old Akontansi, Mile7/Adieye, Iduaprim, New Atuabo, and Old Atuabo (Figure 2). The survey data was analyzed through descriptive statistics, such as percentages and cross-tabulation, and inferential statistics, such as analysis of variance (ANOVA) and Spearman's rank correlation analysis. The Statistical Package for Social Science (SPSS) was used to analyze the survey data, while qualitative data was analyzed using NVivo.

RESULTS AND DISCUSSION

In this section, the results for the study are presented and discussed. The main question is whether the liberalization of Ghana's mining sector result in deregulating and weakening of the mining and environmental laws. The researcher asked the respondents to rate seven issues about the liberalization of the mining sector on a 5-point Likert scale (Table 1). The survey and the qualitative results were analyzed separately and interpreted to

Table 1: Mining sector liberalization's effect on the mining and environmental laws

	Descriptive Statistics PERCENTAGES							Inferential Statistics ANOVA	
Weaknesses in the mining and environmental laws due to mining sector liberalization	**NA**	**VLD**	**NA + VLD**	**AV**	**HD**	**VHD**	**HD + VHD**	**F-value**	**P-value Sig.**
The mining and environmental laws failed to include specifics and are not clear	14.0%	9.5%	23.5%	6.6%	52.2%	17.7%	69.9%	44.709	0.000
The mining and environmental laws failed to contain proper mechanisms to screen and assess information on mining technologies	10.9%	12.4%	23.3%	11.0%	55.2%	10.5%	65.7%	97.352	0.000
The mining law contradicted land and environmental laws	11.7%	14.2%	25.9	3.7%	61.7%	8.7%	70.4%	45.526	0.000
The mining and environmental laws failed to include any clause prohibiting mining activities in the protective forest reserves	10.2%	21.6%	31.8	7.4%	53.1%	7.7%	60.8%	50.714	0.000
The mining and environmental laws do not contain a provision for mining reclamation	16.3%	12.2%	28.5	11.6%	52.5%	7.4%	59.9%	110.310	0.000
Ghana's mining sector environmental standards are weaker than those of the developed countries	9.0%	17.4%	26.4	5.0%	61.2%	7.4%	68.6%	33.118	0.000
Mining and environmental laws failed to prohibit surface mining and heap leach mining	10.6%	6.6%	17.2	10.7%	57.8%	14.3%	72.1%	14.303	0.000

Source: Tarkwa-Nsuaem field survey, 2025

Legend: "NA(1)=Not at all," "VLD(2)=Very low degree," "AV(3)=Average," "HD(4)=High degree," to "VHD(5)=Very high degree." Further, NA+VLD="Not at all or Very low degree," and HD+VHD="High degree or Very high degree."

determine whether they support each other.

The results in Table 1 show that most respondents affirmed each of the seven weaknesses in the mining and environmental laws. The highest-ranked weakness was the failure of the mining and environmental laws to prohibit surface and heap leach mining (72.1% = high + very high degree). This percentage is followed by 70.4% of the respondents who, to a high or very high degree, believed that the new mining law contradicted the existing land and environmental laws. The extreme environmental degradation associated with surface and heap leach mining mainly contributed to this perception (Agbesinyale, 2003).

Many interviewees and focus group participants supported this view that there are weaknesses in the mining and environmental laws. They indicated that the laws provided that the mining companies should implement measures to protect the environment. However, they said these laws failed to specify what the companies must do to manage environmental degradation associated with surface and heap leach mining. This result aligns with Akabzaa's (2000) observation that although Ghana's 1986 Minerals and Mining Law stipulated that the holder of the mineral rights should protect the environment, it failed to specify what the holder must do.

Many key informants also emphasised the contradiction between the mining, land, and environmental laws. They stated that these laws have different purposes. For example, they said that while the land law prohibited mining in the forest reserves and national parks, the mining law permits it. The key informants noted that this contradiction has resulted in difficulty in ensuring environmental quality in the mining sector, since the environmental regulatory institutions and agencies did not have a clear legal basis for preventing mining in forest reserves and national parks. This finding supports the findings of Crawford (2015) and Crawford and Bliss's (2017) that mining and environmental laws in developing countries contradict each other and do not contain relevant provisions to ensure environmental protection.

Other significant weaknesses in the mining and environmental laws were the lack of clarity and failure to include specifics, such as provision on reclamation of mined-out and degraded lands (69.9%) and lack of mechanisms to screen and assess information on mining technologies (65.7%). An official of Wacam shared the following on these two weaknesses:

Ghana's mining and environmental laws lack clarity after the liberalization of the mining sector and have loopholes that the mining companies have exploited to degrade the environment. These laws do not have specifics that direct what must be done in a particular situation to ensure environmental quality. I do not think the mining and environmental laws contained clauses on the surface and heap leach mining and on mechanisms to assess whether mining technologies are environmentally friendly in many other areas. The government has to improve the laws.

This comment pointed out key issues about Ghana's mining and environmental laws. First, it stated that these laws lack clarity and do not contain clauses on specific issues, such as conserving and preserving protected areas such as forest reserves and national parks. Second, these laws do not include clauses on assessing information on mining technologies to evaluate and analyse documentation on environmental impacts and mitigation measures of surface and heap leach mining. This evaluation would have helped stakeholders decide about adopting or improving mining technology. The comment also noted that mining companies have used these loopholes to their advantage. These results support Larsey's (1997) and Akabzaa's (2000) observation that the environmental provisions of the 1986 Minerals and Mining Law were unclear, unspecified, or unsuitable.

The majority of the survey respondents (68.6%) believed that the environmental standards for air and water pollution and land degradation in Ghana's mining sector are weaker than that of developed countries. However, there were conflicting opinions among the interviewees. While most (69.7%) of these interviewees agreed with this opinion, only few (30.3%) of them thought that Ghana's environmental standards compare favourably with that of other African countries and are stringent enough to protect the environment. For example, one respondent (an opinion leader) said:

Although people argue that Ghana's mining and environmental laws are the same as those of other African countries, they are lower than those of developed countries. The fact remains that the mining sector reforms have led to lowering the environmental standards in the country's mining sector. African countries compete in lowering their environmental standards to attract foreign investment. As a result, the environmental standards in Africa are generally low. There is a significant difference between Ghana's environmental standards and developed countries.

This respondent thought that Ghana's environmental legislation was far less stringent than that of the developed world, and therefore could not ensure environmental sustainability. The respondent suggested that environmental laws should be compared with those of developed countries and not African countries to ensure environmental quality.

Furthermore, most survey respondents confirmed the failure of mining and environmental laws to include any clause prohibiting mining activities in the protective forest reserves (61.8%) and making provision for mining reclamation (59.9%). Many interviewees and participants from the focus groups observed that the reforms have weakened the mining sector's environmental standards. The respondents said there is no clause on land reclamation or prohibition of mining in forest reserves. Furthermore, the respondents referred to the lack of specific mining and environmental law clauses and regarded it as loopholes. These views are linked to Crawford and Bliss' (2017) who argued that managing environmental pollution has been left to the discretion of mining companies. An official of the Ghana Water Company shared the following view:

One of the things we have overlooked in the mining sector reforms

and the liberalization of Ghana's mining sector was the level to which the environmental standards have been lowered, and the environmental regulation has been weakened. The current laws are weak and have failed to protect the environment in the mining sector. However, the government focused only on the economic benefits the country could derive from this liberalization, disregarding environmental degradation.

This official highlighted how environmental laws have not received attention due to their embedded liberalisation. He further stated that the government focused on the economic benefits at the cost of environmental quality.

The ANOVA results in Table 1 indicate a significant difference (p-values = 0.000 < 0.05) in the respondents' opinions (Dosumu & Aigbavboa, 2021) on the assessment of the significance of the weaknesses in the mining and environmental laws. This shows the respondents' varying views within and between the six categories (Kim, 2014). Table 2 shows a contingency table (cross-tabulation), specifying differences in the opinions between the categories of respondents.

Most mining community members (92.2%), civil servants (84.1%), employees of civil society organisations (85.5%), and UMaT lecturers and students (76.5%) affirmed that liberalisation had weakened the mining and environmental laws. Conversely, 79.6% (Not at all + Very low degree) of officials and employees of the mining companies thought the weakness in these laws was minimal. In comparison, 71.7% of small-scale miners believed it was moderate. The contrary views of officials and employees of mining companies and small-scale miners could be attributed to what East (2016) called respondent bias. Employees may have been unwilling to implicate their companies for job security.

Table 2: Cross-tabulation respondent categories and their agreement level on weakness in the mining and environmental laws after mining sector liberalization

Job category of the respondent in the municipality		Weakness in the mining and environmental laws							Row Total
		NA	VLD	NA + VLD	AV	HD	VHD	HD + VHD	
Mining community members	No.	0	0	0	5	53	6	59	64
	%	0.0	0.0	0.0	7.8	82.8	9.4	92.2	17.2
Civil servants	No.	0	4	4	6	45	8	53	63
	%	0.0	6.3	6.3	9.5	71.4	12.7	84.1	16.9
Employees of civil society organizations	No.	0	0	0	9	41	12	53	62
	%	0.0	0.0	0.0	14.5	66.1	19.4	85.5	16.7
UMaT students and lecturers	No.	4	5	9	6	42	7	49	64
	%	6.3	7.8	14.1	9.4	65.6	10.9	76.5	17.2
Small-scale miners	No.	5	38	43	5	4	8	12	60
	%	8.3	63.3	71.7	8.3	6.7	13.3	20.0	16.1
Officials and employees of mining companies	No.	10	37	47	7	3	2	5	59
	%	16.9	62.7	79.6	11.9	5.1	3.4	8.5	15.99
Column Total	**No.**	**19**	**84**	**103**	**38**	**188**	**43**	**231**	**372**
	%	**5.1**	**22.6**	**27.7**	**10.2**	**50.5**	**11.6**	**62.1**	**100**

Source: Tarkwa-Nsuaem field survey, 2025

Legend: "NA(1)=Not at all", "VLD(2)=Very low degree", "AV(3)=Average", "HD(4)=High degree", to "VHD(5)=Very high degree." Further, NA+VLD= Not at all or Very low degree and HD+VHD= High degree or Very high degree.

Table 3 shows Spearman's rank correlation between mining sector liberalisation and the weakening of the mining and environmental laws, using data collected from the 372 respondents.

The results in Table 3 (r = 0.833 and p-value = 0.000) revealed that, in the respondents' opinion, a strong positive

Table 3: Spearman's rank correlation between mining sector liberalization and weakness in the mining and environmental laws

Variables	Correlations	Mining sector liberalization	Weaknesses in the mining and environmental laws
Mining sector liberalization	Correlation Coefficient	1.000	0.833**
	P-value		0.000
Weaknesses in the mining and environmental laws	Correlation Coefficient	0.833**	1.000
	P-value	0.000	

	N	372	372
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: Tarkwa-Nsuaem field survey, 2025

Legend: Spearman's Rank Correlation coefficient (r) ranges between -1 and +1. Positive correlations indicate a direct relationship, while negative correlations show an inverse relationship. For positive correlations, correlation is very weak for r from 0.01 to 0.19, weak for r from 0.20 to 0.39, moderate for r from 0.40 to 0.59, strong for r from 0.60 to 0.79, very strong for r from 0.8 to 0.99 and perfect if r is 1 (Salkind 20The 09). The P-value is significant if than 0.05, but not significant otherwise.

relationship existed between mining sector liberalisation and weaknesses in the mining and environmental laws at a 99.9% confidence level. This indicates that despite varying views among the categories of respondents, this finding confirms that Ghana's mining sector liberalisation in the 1980s has led to the deregulation and weakening of Ghana's mining and environmental laws. This result agrees with the findings of Awudi (2002) and Campbell (1997) that the content of the mining laws and environmental laws applicable to the mining industry of developing countries are weak and reflect the goals of mining sector liberalisation.

Major Insights Emerging from the Findings

• A strong majority of respondents identified significant weaknesses in Ghana's mining and environmental laws following sector liberalization. The most critical issues include: failure to prohibit destructive methods like surface mining and heap leaching (72.1%), contradictions between mining and environmental laws (70.4%), lack of clarity and specificity (69.9%), and weaker environmental standards than in developed countries (68.6%).

• Major regulatory gaps persist in prohibiting harmful mining techniques, mandating effective reclamation, assessing mining technologies, and protecting sensitive ecosystems such as forest reserves.

• Spearman's correlation analysis shows a very strong positive relationship ($r = 0.833$, $p = 0.000$) between liberalization and the weakening of environmental protections. Qualitative data confirmed that laws are vague, rife with loopholes, and grant mining company's excessive discretion.

• While mining communities, civil society, and academics strongly criticized the frameworks, industry stakeholders downplayed the weaknesses. Institutional conflicts, resource shortages, and limited public participation further hamper enforcement. Overall, liberalization boosted investment but at a substantial environmental cost.

Direction for Future Research

This study analyzed whether liberalization of Ghana's mining sector has resulted in deregulation and weakening of the mining and environmental laws with regards to mining companies in Tarkwa mining area. Future studies should analyze the effect of Ghana's mining liberalization on the stringency of mining and environmental laws for companies in other mining areas, such as Obuasi and Kenyasi.

CONCLUSIONS

This study provides strong empirical evidence that Ghana's mining sector liberalization since 1986 has significantly contributed to the deregulation and weakening of mining and environmental laws. Findings show a very strong positive correlation ($r = 0.833$, $p < 0.001$) between liberalization and critical legal weaknesses, including vague provisions, the absence of bans on destructive practices such as surface mining and heap leaching, a lack of mandatory reclamation, and poor enforcement.

While liberalization successfully increased mineral production and FDI, it came at a high environmental cost, reflecting a "race to the bottom" in regulatory standards, particularly in Tarkwa-Nsuaem Municipality. Divergent stakeholder perceptions further reveal tensions between economic interests and environmental sustainability.

Policy Recommendations

Drawing directly from the study's results, the following recommendations are proposed:

• Revise the Minerals and Mining Act and the EPA Act to prohibit highly destructive methods, enforce mandatory reclamation with financial bonds, and set clear environmental standards.

• Harmonize contradictions across mining, land, and environmental laws.

• Strengthen institutional capacity and coordination of the EPA and the Minerals Commission.

• Enhance transparency, public participation, and Free, Prior, and Informed Consent (FPIC) for affected communities.

• Adopt international best practices and introduce economic incentives for cleaner technologies.

• Formalize small-scale mining (galamsey) with environmental safeguards and alternative livelihoods.

REFERENCES

Ackah, C., Adjasi C., & Turkson, F. (2014). *Scoping study on the evolution of industry in Ghana* (WIDER Working Paper No. 2014/075). United Nations University World Institute for Development Economic Research. https://doi.org/10.35188/UNU-WIDER/2014/796-7

Addai, K. N., & Baiden, W. B. (2014). Effect of small-scale mining on the environment of Tarkwa-Nsuaem Municipality of Ghana. *Journal of Environment and Earth Science, 4*(9), 73-80. https://core.ac.uk/download/pdf/234663417.pdf

Afriyie, K., Ganle, J. K. & Adomako, J. A. A. (2016). The good in evil: A discourse analysis of the galamsey industry in Ghana. *Oxford Development Studies, 44*(4), 493-508. https://doi.org/10.1080/13600818.2016.1217984

Agbesinyale, P. K. (2003). *Ghana's gold rush and regional development: The case of Wassa West District.* SPRING Centre, Technical University Dortmund.

Akabzaa, T. M. (2000). *Boom and dislocation: The environmental and social impacts of mining in the Wassa West District of Ghana.* Third World Network-Africa.

Akabzaa, T. M., & Darimani, A. (2001). *Impact of mining sector investment in Ghana: A study of Tarkwa mining region.* Report prepared for for SAPRIN (Structural Adjustment Participatory Review International Network) https://www.scirp.org/(S(i43dyn45teexjx455qlt3d2q))/reference/ReferencesPapers.aspx?ReferenceID=2598314

Akafia, M. E., Kuenyehia Sr., K., & Kuenyehia, S. (2017). Ghana. In M. Bourassa & J. Turner (Eds.), *Mining: Getting the deal through* (pp. 106-113). Law Business Research Press. https://www.wider.unu.edu/sites/default/files/Publications/Working-paper/PDF/wp2017-179.pdf

Akayuli, C. F. A., Gidigasu, S. S. R. & Gawu, S. K. Y. (2013). Geotechnical evaluation of a Ghanaian black cotton soil for use as clay liner in tailings dam construction. *Ghana Mining Journal, 14,* 21-26.

Ali, A. (2009). Implications of trade liberalisation to Malaysia's mining industry. *Bulletin of the Geological Society of Malaysia, 55,* 1-6. https://doi.org/10.7186/bgsm55200901

Aliyu, A. J. & Ismail, N. W. (2015). Foreign direct investment and pollution haven: Does energy consumption matter in African countries? *International Journal of Economics and Management, 9*(S), 21-39.

African Mining Legislation Atlas. (n.d.). *AMLA guiding template: Full document (Part A–E).* The World Bank. https://documents1.worldbank.org/curated/en/202671487783309731/pdf/African-Mining-Legislative-Framework-AMLA-Guiding-Template.pdf

Amponsah-Tawiah, K., & Dartey-Baah, K. (2011). The mining industry in Ghana: A blessing or a curse. *International Journal of Business and Social Science, 2*(12), 62-69. https://ijbssnet.com/journals/Vol._2_No._12%3B_July_2011/8.pdf

Appiah, D. O., & Osman, B. (2014). Environmental impact assessment: Insights from mining communities in Ghana. *Journal of Environmental Assessment Policy and Management, 16*(4), 1-20. https://doi.org/10.1142/S1464333214500318

Aryee, B. N. A. (2001). Ghana's mining sector: Its contribution to the national economy. *Resources Policy, 27*(2), 61-75.

Aubynn, T. (2017). *Regulatory structures and challenges to developmental extractives: Some practical observations from Ghana* (UNU-WIDER Working Paper 2017/179). United Nations University World Institute for Development Economics Research. https://www.econstor.eu/bitstream/10419/190024/1/wp2017-179.pdf

Awudi, G. B. K. (2002, February 7-8). The role of foreign direct investment (FDI) in the mining sector of Ghana and environment [Paper presentation]. Canadian College of Naturopathic Medicine (CCNM) Global Foreign Direct Investment and the Environment Conference, Paris, France. http://www.oecd.org/countries/ghana/1819492.pdf

Bastida, E. (2002). *Integrating sustainability into legal frameworks for mining in some selected Latin American countries* (Mining, Minerals and Sustainable Development Report No. 120). International Institute for Environment and Development.

Bhatt, R. P. (2023). Environmental impact assessment system and process in developing countries. *Open Journal of Ecology, 13,* 977-1009. https://doi.org/10.4236/oje.2023.1312059

Birch, K., & Mykhnenko V. (2009). Varieties of neoliberalism? Restructuring in large industrially dependent regions across Western and Eastern Europe. *Journal of Economic Geography, 9*(3), 355-380. https://doi.org/10.1093/jeg/lbn058

Campbell, B. (2010). Revisiting the reform process of African mining regimes. *Canadian Journal of Development Studies, 30*(1), 197-217.

Centre for Remote Sensing and Geographic Information Service. (2025). *Western Region and Tarkwa-Nsuaem Municipality.* University of Ghana.

Crawford, A. (2015). *The mining policy framework: Synthesis report.* International Institute for Sustainable Development.

Crawford, A., & Bliss M. (2017). *IGF mining policy framework assessment: Suriname.* International Institute of Sustainable Development. https://www.iisd.org/publications/igf-mining-policy-framework-assessment-suriname

Daniel, J. (2011). *Sampling essentials: Practical guidelines for making sampling choices.* SAGE Publications.

Dosumu, O. S. & Aigbavboa, C. O. 2021. Drivers and effects of sustainable construction in the South African construction industry. *Acta Structilia, 28*(2), 78-107. https://doi.org/10.18820/24150487/as28i2.4

Environmental Law Alliance Worldwide. (2010). Overview of mining and its impacts. In *Guidebook for evaluating mining projects* (pp. 8-9). ELAW. https://doi.org/10.1016/S0304-3878(02)00084-6

Ghana Statistical Service. (2014). *2010 population and housing census: District analytical report: Tarkwa-Nsuaem Municipality.* https://www2.statsghana.gov.gh/docfiles/2010_District_Report/Western/Tarkwa%20Nsuaem.pdf

Gill, F. L., Viswanathan, K. K., & Karim, M. Z. A. (2018). The critical review of the pollution haven hypothesis. *International Journal of Energy Economics and Policy, 8*(1),

167-174. https://www.econjournals.com/index.php/ijeep/article/view/5678

Hogan, J. (2010). Economic crises and policy change in the early 1980s: A four-country comparison. *Journal of Australian Political Economy, 65*(2), 106-137. https://doi.org/10.21427/D7S201

Jedwab, R., & Osei, R. D. (2012). *Structural change in Ghana, 1960–2010* (International Household Survey Network Working Paper No. IIEP-WP-2012-12). International Household Survey Network. http://www.gwu.edu/~iiep/assets/docs/papers/Jewab_IIEPWP2012-12.pdf

Jhang, W. G. (2018). The vulnerability of occupational health and safety to regulation: The weakening of information regulations during the econom9ic crises in Korea. *A Journal of Environmental and Occupational Health Policy, 28*(1), 151-168. https://doi.org/10.1177/1048291117743781

Kellenberg, D. K. (2009). An empirical investigation of the pollution haven effect with strategic environment and trade policy. *Journal of International Economics, 78*(2), 242-255.

Kilicarslan, Z., & Dumrul, Y. (2017). Foreign direct investments and CO2 emissions relationship: The case of Turkey. *Business and Economics Research Journal, 8*(4), 647-660.

Kim, H-Y. (201)4. Analysis of variance (ANOVA): Comparing means of more than two groups. *Restorative Dentistry and Endodontics, 39*(1), 74-77. https://doi.org/10.5395%2Frde.2014.39.1.74.

Larsey, M. (1997). The minerals and mining law of 1986, PNDC Law 153: Is the environment protected? *Newsletter, EPA-Ghana, 1*(7), 1-8. https://prabook.com/web/larsey.mensah/3271920

Leslie, J. R. (2016). *Enterprise location decisions and the pollution haven hypothesis.* https://economics.nd.edu/assets/214435/enterprise_location_decisions_and_thepollution_haven_hypothesis.pdf

LEX Africa. (2019). *LEX Africa guide to mining regimes in Africa.* LEX Africa. https://www.lexafrica.com/wp-content/uploads/2019/02/LEX-Africa-MINING-GUIDE-DIGITAL.pdf

Mancini, L., & Sala, S. (2018). Social impact assessment in the mining sector: Review and comparison of indicators frameworks. *Resources Policy, 57,* 98-111. https://doi.org/10.1016/resourpol.2018.02.002

Nasrollahi, Z., Moradi, M., & Rezaei, H. (2014). Pollution haven hypothesis and foreign direct investment: Evidence from selected Asian countries. *Journal of International Relations, 12*(2), 111-124. https://fmv.euba.sk/RePEc/brv/journl/MV2014-2.pdf

Natural Resource Governance Institute. (2015). *Legal framework: Navigating the web of laws and contracts governing extractive industries.* NRGI Reader.

Ou, J. (2011). *Foreign direct investment and environmental regulation: A new theoretical framework* [Master's thesis, University of Groningen].

Overseas Development Institute. (1996). *Adjustment in Africa: Lessons from Ghana* (ODI Briefing Paper No. 3). https://cdn-odi-production.s3-website-eu-west-1.amazonaws.com/media/documents/2634.pdf

Parliament of the Republic of Ghana. (1962). *Minerals Act, 1962* (Act 126).

Poelhekke, S, & van der Ploeg, F. (2012). Green havens and pollution havens. *The World Economy, 38*(7), 1159-1178. https://onlinelibrary.wiley.com/doi/10.1111/twec.12219

Rasiah, R. (1999). *Transnational corporations and the environment: The case of Malaysia* (Occasional Paper No. 4). UNCTAD/CBS Project, Copenhagen Business School. https://research-api.cbs.dk/ws/files/59007666/6946.pdf

Rasit, N. B., & Aralas, S. B. (2017, November 28-29). *The pollution haven hypothesis: An analysis of ASEAN and OECD countries* [Conference presentation]. International Conference on Economics, Universiti Malaysia, Sabah, Malaysia. https://www.ums.edu.my/fpep/files/Norazean.pdf

Republic of Ghana. (1986). *Minerals and Mining Law, 1986, PNDC* (Provisional National Defence Council) Law 153). Ghana Publishing Corporation. http://www.vertic.org/media/National%20Legislation/Ghana/GH_Minerals_Mining_Act_1986.pdf

Republic of Ghana. (2014). *Minerals and mining policy of Ghana: Ensuring mining contributes to sustainable development.* http://extwprlegs1.fao.org/docs/pdf/gha194056.pdf

Republic of Ghana. (2019). *Tarkwa-Nsuaem municipal assembly composite budget for 2019-2022.*

Rezza, A. A. (2013). FDI and pollution haven: Evidence from Norwegian manufacturing sector. *Ecological Economics, 90*(C), 40-149. https://doi.org/10.1016/j.ecolecon.2013.03.01

Rivera, J., & Oh, C. H. (2013). Environmental regulations and multinational corporations' foreign market entry investments. *Policy Studies Journal, 41*(2), 243–272. https://doi.org/10.1111/psj.12016

Rutherford, L. & Ofori-Mensah, M. (2011). Ghana's mining code: In whose interest? *Governance Newsletter, 17*(4), 1-8.

Schram, A., Friel, S., VanDuzer, A., Ruckert, A. & Labonte, R. (2018). Internationalisation of international investment agreements in public policymaking: Developing a conceptual framework of regulatory chill. *Global Policy, 9*(2), 193-202.

Shemberg, A. R. (2008). *Stabilisation clauses and human rights.* International Finance Corporation, World Bank Group. https://www.ifc.org/wps/wcm/connect/0883d81a-e00a-4551-b2b9-46641e5a9bba/Stabilization%2BPaper.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-0883d81a-e00a-4551-b2b9-46641e5a9bba-jqeww2e

Solarin, S. A., Al-Mulali, U., Musa, I. & Ozturk, I. (2017). Investigating the pollution haven hypothesis in Ghana: An empirical investigation. *Energy, 124*(C), 706-719. https://doi.org/10.1016/j.energy.2017.02.089

Sulaiman, L. A., Migoro, S. O. & Aluko O. A. (2014). The structural adjustment programme in developing economies: Pain or gain? *Evidence from Nigeria. Public and Municipal Finance, 3*(2), 41-48.

Tang, S., Tang, C. & Wing-Hung Lo, C. (2005). Public participation and environmental impact assessment in mainland China and Taiwan: Political foundations of environmental management. *Journal of Development Studies, 41*(1), 1-32.

Tandoh, A. (2021). *Manager's challenges complying with environmental regulations in Ghana's mining sector* [Doctoral dissertation, Walden University]. Walden Dissertations and Doctoral Studies Collection.

Temurshoev, U. (2006). Pollution haven hypothesis or factor endowment hypothesis: Theory and empirical examination for the US and China. *SSRN Electronic Journal.* https://www.cerge-ei.cz/pdf/wp/Wp292.pdf

Tetreault, D. (2014). Free-market mining in Mexico. *Critical Sociology, 42*(4), 643-659. https://www.researchgate.net/publication/276845160_Free-Market_Mining_in_Mexico

Thenepalli, T., Chilakala, R., Habte, L., Tuan, L. Q., & Kim, C. S. (2019). A brief note on the heap leaching technologies for the recovery of valuable metals. *Sustainability, 11*(12), 3347. https://doi.org/10.3390/su11123347

Tienhaara, K. (2006). Mineral investment and the regulation of the environment in developing countries: Lessons from Ghana. *International Environmental Agreement, 6*(4), 371-394.

Thomson, M., Kentikelenis, A., & Stubbs, T. (2017). Structural adjustment programmes adversely affect vulnerable populations: A systematic-narrative review of their effect on child and maternal health. *Public Health Reviews, 38*(1), 1-18. https://publichealthreviews.biomedcentral.com/articles/10.1186/s40985-017-0059-2

Tsuma, W. (2010). *Gold mining in Ghana: Actors, alliances and power.* LIT Verlag. https://www.amazon.com/Gold-Mining-Ghana-Alliances-Development/dp/3643108117

Tuokuu, F. (2019). *Environmental policy assessment in the Ghanaian gold mining industry: Insights from stakeholders* [Doctoral dissertation, Antioch University New England]. Dissertations & Theses. https://aura.antioch.edu/etds/468

Tuokuu, F. X. D., Gruber, J., Idemudia, U., & Kayira, J. (2018). Challenges and Opportunities of environmental policy implementation: Empirical evidence from Ghana's gold mining sector. *Resources Policy, 59*(2018), 435-445.

United Nations. (2017). *World economic and social survey 2017: Reflecting on 70 years of development policy analysis.* https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/WESS_2017-FullReport.pdf

United Nations Development Programme Ghana. (2015). *Final report: Review of alignment between the African Mining Vision (AMV) and Ghana's policy/legal frameworks for solid minerals.* UNDP Ghana. https://www.gh.undp.org/content/ghana/en/home/library/poverty/review-of-aalignment-between-the-africa-mining-vision--amv--and-.html

Van Harten, G. & Scott, D. N. (2016). Investment treaties and international vetting of regulatory proposals: A case study from Canada. *Osgoode Legal Studies Research Paper Series, 12*(6), 1-27.

Wassa Association of Communities Affected by Mining. (2010). *Review: Minerals and Mining Act.* https://www.modernghana.com/news/301712/review-minerals-and-mining-act-wacam.html

Watkins, K. (1995). *The Oxfam poverty report.* Oxfam. https://oxfamilibrary.openrepository.com/bitstream/handle/10546/122886/bk-oxfam-poverty-report-introduction-010195-en.pdf

Wheeler, D. (2002). Beyond pollution havens. *Global Environmental Politics, 2*(2), 1-10. https://doi.org/10.1162/15263800260047781

World Bank. (1992). *Strategy for African mining* (World Bank Technical Paper No. WTP 181; African Technical Department Series). https://documents1.worldbank.org/curated/en/722101468204567891/pdf/multi-page.pdf

World Bank. (2013). *Mining reform and the World Bank: Providing a policy framework for development.* https://documents.worldbank.org/curated/en/511531468782172927/Mining-reform-and-the-World-Bank-providing-a-policy-framework-for-development

Yoon, H., & Heshmati, A. (2017). *Do environmental regulations affect FDI decisions? The pollution haven hypothesis revisited* (GLO Discussion Paper No. 86). Global Labor Organization. https://www.econstor.eu/bitstream/10419/162778/1/GLO_DP_0086.pdf