

# Exploring Spirituality, Successes, and Land Degradation Nexus in Small-Scale Gold Mining (Galamsey) in Ghana: Evidence from the Wa East District

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**Received**  
November 20, 2020

**Accepted**  
March 10, 2021

**Published Online**  
June 28, 2021

**Abstract:** This study assesses the implication of traditional beliefs and practices of local miners on land degradation. The effect of artisanal and small-scale mining on land degradation is alarming in recent times in Ghana. In resolving this problem, one key area that has received little recognition in the mining discourse is the consequence of beliefs, customs, and rituals associated with local miners on land degradation. A cross-sectional survey design with a mixed methods research approach was used. Questionnaires were administered to 93 respondents drawn from three local mining communities and supported with key informants and in-depth interviews. The findings indicate that rituals are performed at the commencement of mining to appease both the land and the spirit of gold. Secondly, successful gold mining exploits are associated with successful rituals and powerful spiritual fathers. Thirdly, native spiritual sources that produced successful gold mining exploits are consulted often by miners. Novice miners seek any spiritual support available. Finally, miners claim that powerful spiritual fathers can avert punishment for degrading or defiling the land. The study concludes that beliefs, practices, including rituals upheld in high esteem by local miners, significantly contribute to land degradation in local mining communities. To stem such degradation calls for collaboration between the government and the spiritual fathers to monitor local miners' activities.

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Cite this article as Baddianaah, I., K. Peprah and A. Adams. 2021. **Exploring spirituality, successes, and land degradation nexus in small-scale gold mining (Galamsey) in Ghana: Evidence from the Wa East District.** Journal of Environmental & Agricultural Sciences. 23(1&2): 11-21.



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## 1. Introduction

Globally, artisanal and small-scale mining (ASM) operations remain indispensable for the expansion of local economies. As of 2017, about 40.5 million of the global population was directly employed in the ASM sector ([Intergovernmental Forum on Mining, Minerals, Metal, and Sustainable Development \[IGF\], 2017](#)). Artisanal and small-scale mining is primarily defined based on technological advancement,

methods, factors, and scope of operation. Artisanal and small-scale mining occurs predominantly in the informal sector, employing low technologies, crude methods, and is dominated by native miners ([Ofosu-Mensah, 2011](#); [Hilson and McQuilken, 2014](#)). Another dominant feature of ASM operations is the high level of illegality surrounding the sector ([Boadi et al., 2016](#); [Omotehinse and Ako, 2019](#)). The majority of artisanal and small-scale mining operations particularly in the developing world including sub-Saharan Africa are unregistered and

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deeply immersed in traditional methods, beliefs and practices including rituals (Mondlane and Shoko, 2003; Bryceson et al., 2010; Ofosu-Mensah, 2011; Addei and Amankwah, 2011; Sarpong, 2015; Hirsech, 2017). As a result, there remains a wide gap between artisanal miners and scientific methods to stimulate environmental sustainability in line with ASM operations.

Artisanal and small-scale mining is known as 'galamsey' in Ghana, which translates literally as 'gather and sell' (Ofosu-Mensah, 2010; Snapir et al., 2017). However, a distinction is often made between artisanal mining (*galamsey*) and small-scale mining. The former describes unlicensed mining operations while the latter defines licensed mining enterprises aside from large-scale mining corporations. Be that as it may, it remains problematic establishing a unique dichotomy between the two. The associated ill-effects of ASM operations on the biophysical environment of Ghana have long been documented by several scholars (Hilson, 2001; Akabzaa and Darimani, 2001; Akabzaa et al., 2007; Kusimi, 2008, Kusimi and Kusimi, 2012; Boadi et al., 2016; Owusu et al., 2019). Consistent with the literature on ASM operations are environmental ramifications including land degradation, deforestation, water pollution, public health and safety, climate change, and biodiversity loss (Boadi et al., 2016; Owusu et al., 2019). Also, ASM operations tend to cause permanent head disorders due to the increased use of mercury by artisanal and small-scale miners (Hilson and Pardie, 2006). This notwithstanding, the ASM sector continues to grow in numbers. According to Hilson and Clifford (2010), about 1 million out of Ghana's 28 million population work directly as artisanal and small-scale miners. Fast forward, a related study conducted by McQuilken and Hilson (2016) reports that over a million of Ghana's population are directly involved in ASM operations and approximately 4.5 million Ghanaians are associated with artisanal and small-scale mining operations through indirect income-generating transactions.

The adverse effects of ASM activities on water resources and land degradation have taken center stage in recent years in Ghana. ASM activities seriously threaten water bodies that serve domestic and industrial water needs across villages and cities (Water Resource Institute, 2013; Boadi et al., 2016; Bagah et al., 2016; Owusu et al., 2019). It is common to see small-scale artisanal miners enter water bodies (primarily rivers) and washed the substances collected from the mines, which are believed to

contain gold ore. By so doing, the rivers become muddy at that point and turbid downstream. The worst scenario is that land degradation caused by the local miners is ubiquitous and a significant disincentive to smallholder farmers in the Wa East District (Agyemang and Akoto, 2014; Bagah et al., 2016). The artisanal and small-scale miners do not respect both the Earth goddess and River gods. Hence, the impunity has partly resulted in water pollution and land degradation in the Wa East District.

An array of governments' efforts to stem *galamsey* include May 2013 presidentially formed Inter-Ministerial Committee (Anti-Galamsey Task Force) to remedy the situation. In April 2017, Media Coalition against *Galamsey* was also formulated. In July 2017, the government through the recommendation of an Inter-Ministerial Committee on Illegal Mining (IMCIM) put together 400 combined police and a military force called 'Operation Vanguard' to enforce a unilateral ban on *galamsey* in Ghana (Owusu et al., 2019). Also, the government commenced the 'Galamsey Reclamation Project' in the Eastern Region of Ghana in November 2017.

However, it remains uncertain as to whether these institutional arrangements may address the ASM menace in Ghana. Corrupt practices perpetuated by institutions tasked to sanitize the ASM sector remain a topical issue (Owusu et al., 2019; Mynewsgh, 2020). Issues of land degradation and water pollution caused by artisanal miners revert to assuming similar status as before. While further measures to stem land degradation in the ASM sector remain paramount, the forces, beliefs, practices, successes that facilitate local miners to degrade the land received little attention from the academic community. Notably, literature has confirmed the massive use of rituals and supernatural forces by local miners in enhancing profitability in their operations in Ghana (Addei and Amankwah, 2011; Sarpong, 2015). Conversely, establishing a link between local miners' beliefs, practices (including the use of rituals) and land degradation caused by these local miners is yet to be explored probably, due to the clandestine nature of the whole concept.

The African is said to be notoriously and incurably religious (Mbiti, 1969). Africans take their religion everywhere and show their religion in their livelihood activities. In Ghana, spiritual qualities are attributed to everything that constitutes nature. The belief system is built around a Supreme Being, Earth goddesses, lesser gods, and ancestral spirits (Kpieta and Bonye, 2012). The Earth and its land space are

revered and treated with respect. Many land-based activities in the country begin with traditional prayers by the Earth priests to grant permission to use land. In ASM's case, the initial rituals and traditions to perform to use the land are usually followed (Addei and Amankwah, 2011). During and after mining, the miners' activities on the land do not seem to show any respect to the land and rivers anymore. Traditions and customs regarding land use are abused by miners leading to degraded lands and polluted water bodies (Guri et al., 2012). However, traditional Ghanaian beliefs on land ownership and usage preclude land degradation. Therefore, it is imperative to assess the forces that promote the activities of small-scale miners to find a lasting solution to this problem of land degradation in mining centers. The pertinent question that warrants this study is: how come artisanal and small-scale miners believe and use traditional beliefs and practices, and at the same time cause land degradation?

The mining industry can impact positively and negatively across all the 17 Sustainable Development Goals (SDGs) which are interconnected. Mining can foster economic development by providing opportunities for decent employment, business development, increased fiscal revenues, and infrastructure linkages. Many of the minerals produced by mining are also essential building blocks to technologies, infrastructure, energy, and agriculture. Historically, however, mining has contributed to many of the challenges that the SDGs are trying to address – environmental degradation, displacement of populations, worsening economic and social inequality, armed conflicts, gender-based violence, tax evasion and corruption, increased risk for many health problems, and the violation of human rights (Columbia Centre on Sustainable Investment, UNDP and UN Sustainable Solution Network, 2016).

The SDGs that are core to mining include SDGs 6, 7, 12, 13, and 15 which seek to ensure availability and sustainable management of water and sanitation for all; ensure access to affordable, reliable, sustainable, and modern energy for all; ensure sustainable consumption and production patterns; take urgent action to combat climate change and its impacts; and protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation respectively. Mining is resource-intensive, and therefore requires access to significant amounts of land, water, and energy. It also generates waste products and materials, which require careful

management throughout their life cycle (World Gold Council, 2020). The process of mining leads to environmental damages that have to be addressed urgently considering the environmental and climate degradations facing the World. For instance, the implementation of a mine, and especially an open-pit mine, leads to deforestation and the destruction of rich flora and ecosystem, as well as habitat loss for the fauna that has to migrate to survive, threatening the biodiversity of the region and regions around. Also, the core activity of mining is resource-intensive as it is based on an industrial-scale extraction of minerals from the ground (valuable and non-renewable raw materials), and this leads to resource depletion: mining consumes resources faster than the earth can produce. It means that resources are becoming scarce, and may fall short in the next decades, and this is particularly true for metals (Columbia Centre on Sustainable Investment, UNDP and UN Sustainable Solution Network, 2016).

In Ghana, the mining industry is dominated by illegal small-scale miners whose activities are unregulated by relevant state agencies such as the Mineral Commission, and the Environmental Protection Agency. Therefore, their activities posed a potential risk of jeopardizing the efforts of the government towards the achievement of the SDGs in Ghana.

This study may contribute to anthropogenic solutions to land degradation in mining areas by investigating mining beliefs and practices and consequential effects on land degradation. The results and recommendations tied to miners' beliefs and practices indeed provide some deterrents. Also, it adds to the knowledge of land degradation as the aspect of rituals appears non-empirical to biophysical processes such as land degradation. However, rituals as induced by artisanal miners' beliefs and practices add tenable evidence to the interpretivism and social constructivists' arguments. The study aims to assess the implication of the beliefs and practices of local miners on land degradation. Specifically, the study seeks to: (1) examine the linkages between artisanal and small-scale miners and the use of rituals in mining; and (2) analyze the influence of beliefs and practices in ASM operations on land degradation.

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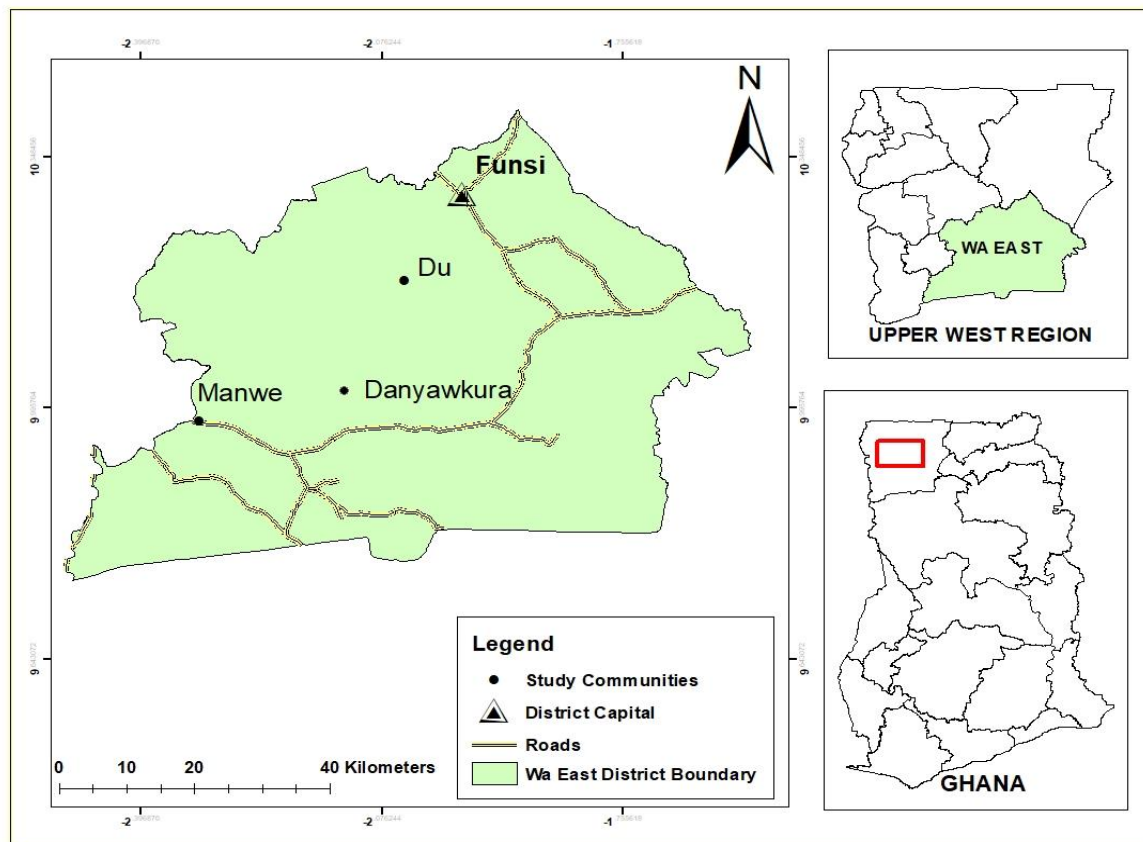
## 2. Materials and Methods

### 2.1. Study setting

This study was undertaken in the Wa East District in the Upper West Region of Ghana (Figure 1). The Wa East District covered a total land area of about

1,078 km<sup>2</sup> and lies between latitudes 9°55'N and 10°25'N and longitude 1°10'W and 2°5'W (Ghana Statistical Service, 2014). The Wa East District has a population of 72,074 out of which males constitute 50.5% and females 49.5%. The people of the District constitute 10.3% of the total population of the Upper West Region. Islam is the dominant religion in the district with 57.8% population of the region. Also, those who practiced Christianity constitute about 26.5%, Traditionalists are 12.5% and those who professed no religion constitute 3% (Ghana Statistical Service, 2014).

The vegetation of the Wa East district is guinea savannah woodland. More than 30% of the natural vegetation has been destroyed by annual bush fires, indiscriminate cutting of trees for fuelwood, and artisanal gold mining. The district consists mainly of pre-Cambrian base rock, granite, and metamorphic rock types. These rocks offer mining opportunities for the local population. The soils are predominantly sandy and loamy. They are very fertile soils that are suitable for the cultivation of tubers, cereals, and legumes. Also, livestock is reared on a large and small-scale in the district (Ghana Statistical Service, 2014).



**Figure 1.** Map of Wa East District Showing the Study Communities Adapted from Ghana Statistical Service (2014).

## 2.2. Research design

The research design employed in this study was a cross-sectional survey design. Both qualitative and quantitative analyses were used to find answers to the research objectives. Study communities' choice was based on the historical and recent intensiveness of ASM operations that resulted in large tracts of land being degraded (rendered bare) in these areas. The Wa East District is endowed with several mining communities e.g. Bulenga, Manwe, Danyawkuraa,

Gorepie, Buna, Du, Baayiri, Kande, and Chaggu. However, ASM operations in Du, Manwe, and Danyawkuraa are intensive in recent times (Ghana Statistical Service, 2014). Hence, these three communities were selected for the survey.

Further, the selection of the study respondents was purely based on artisanal mining activities, that is, the selection of *galamsey* groups (*Ghetos*). A *ghetto* is a jargon explaining the basic unit of classification among artisanal and small-scale miners. Each *ghetto*



has a fragmented human population who are assigned various roles to execute. Some of the roles include 'chisellers and *logo* boys (pullers/pushers)'. These are purely masculine-dominated roles (jobs), with the actors located mostly on the outskirts of the mining communities. Each *ghetto* is recognized with a mining pit or pits and a leader (boss). The number of mining pits to a *ghetto* boss (leader) denotes his wealth and power. Hence, within the study communities, 34 *ghettos* were discovered with a total population of 1,400 artisanal and scale-scale miners (see Table 1). This population of 1,400 miners excludes their bosses and spiritual fathers. This data was obtained during the initial visit to the communities. Therefore, using the study population of 1,400 artisanal and small-scale miners from the selected communities, the sample size was determined using a mathematical formula by Yamane (1967: 886) which is given as follows:

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

Where: n = sample size, N = population, and e = sampling error. According to Ahuja (2001), an acceptable error level traditionally is up to  $\pm 0.05$  or  $\pm 0.10$  (i.e., 5 or 10 percentage points). Therefore, at 0.10 margin of error, the sample size was determined as:

$$n = \frac{1400}{1 + 1400(0.1)^2} = 93 \quad [2]$$

Therefore, a sample size of 93 was used for the study and was distributed among the selected study communities using proportional quota sampling (Table 1).

**Table 1. Distribution of study population**

Name of community	Number of <i>ghettos</i>	Population per <i>ghetto</i>	Miner population	Sample Size
Du	17	15 chisellers 35 <i>logo</i> boys	$50 \times 17 = 850$	56
Manwe	10	5 chisellers 25 <i>logo</i> boys	$30 \times 10 = 300$	20
Danyawkura	7	5 chisellers 20 <i>logo</i> boys	$25 \times 10 = 250$	17
Total	34		1400	93

Source: Authors' Construct, 2019.

In the community, convenient sampling was employed in selecting the 93 respondents for the survey. Thus, any mine worker (chiseller or *logo* boy) met at the *ghetto* or around the mining area who was prepared to be part of the study was selected. Also, the snowball sampling technique was employed in identifying and selecting spiritual workers such as

*mallams*, pastors, fetish priests, and juju-men who helped artisanal and small-scale miners spiritually in their mining activities. These are hard to reach respondents and according to Bhattacharjee (2012), the snowball sampling technique is the best method in such a case. Besides, purposive sampling was used to select the *ghetto* bosses to be part of the study due to their deep insight concerning ASM operations in the area.

Semi-structured questionnaires were administered to the 93 respondents across the selected study communities. The questionnaire's major theme focuses on the driving forces behind the need to seek deific assistance, beliefs, practices, and implications on land degradation. Also, in-depth interviews were conducted with nine (9) leaders (bosses) of the *ghettos* (3 per community) to solicit information on the operations of the *ghettos*, and some of the administrative strategies, and interventions used in achieving their targets. This covered their views on rituals, spiritual entities, and related practices in exploration for gold and their implications. Additionally, key informant interviews (KIIs) were conducted which involved six (6) spiritual workers (two per community) who helped miners explore for gold. They include *mallams*, priests, pastors, and juju-men, identified to have been helping artisanal and small-scale miners in achieving their gold mining targets through spiritual means. These were revered spiritualists who claimed to have several years of experience in the business and could quickly determine miner's fortune. These spiritualists command the power to order a local miner within the study vicinity to mine or not to mine on a particular parcel of land. Additionally, a standard observation checklist was developed and used to guide the researchers in recording some practices observed in line with the study objectives at mining sites.

Data analysis methods include coding and entering data into the Statistical Package for Social Sciences (SPSS) version 22 spreadsheet where appropriate transformations were done. Descriptive statistics and chi-square tests were employed to analyze the quantitative data. Hence, frequencies and percentages were generated and further transformed into cross-tabulations and chi-square analysis. The quantitative results were complemented with direct and indirect quotations of lead miners (bosses) and spiritual fathers. The qualitative data analysis was done using thematic and content analysis.

### 3. Results and Discussion

The study results concerning the respondents' religious denomination suggest that 95.7% of the respondents practiced Islam whilst 4.3% practiced Christianity. All respondents within the Christian faith seek spiritual assistance before engaging in mining activities while 49.4% of those with faith in Islam seek spiritual guidance. Further analysis showed a significant relationship between respondents' religious beliefs and practices, and the quest for deific assistance in their operations. The Pearson Chi-square (3.9) was significant (P-value = 0.048 < 0.05) (see Table 2). Thus, there is enough evidence to reject the notion that there is no relationship between religion and the pursuit of spiritual assistance in mining. The results suggest that religion has no limit on a miner's quest for success in his or her operation. This finding is in line with that of Bryceson et al., (2010) and Ofosu-Mensah (2010) who reported that artisanal miners will go all out, defying the odds to make their operations profitable. Similarly, Hirsech (2017) observed that some local miners engage in rituals to appease the spirits of the land to enable them to have a fair share of the mineral wealth particularly when there are contestations between traditional landowners and state intuitions over the right to mine.

**Table 2. Religion and use of spiritual assistance in mining gold**

Religion	Spiritual assistance in mining Gold		Total
	Yes	No	
Christianity	4 (100.0)	0(0.0)	4(100.0)
Islam	44(49.4)	45(50.6)	89(100.0)
Total	48(51.6)	45(48.4)	93(100.0)

Observation = 93, Pearson Chi-Square ( $\chi^2$ ) = 3.9, df = 1, P-value = 0.048

Source: Field Survey, 2019. Note: All figures in parentheses are percentages.

Qualitative data from respondents suggest that majority of local miners always put religion aside and seek success in their operations. The demand for spiritual assistance operates on the principle of let my will be done instead of the religious doctrine of not my will but thy will be done. A lead miner interviewed elucidates: "For galamsey, there is nothing like a religion here, though we believe in God and share various religious beliefs. When it comes to prospecting for gold, any means that will aid us to make money is the ultimate" (Source: In-depth

Interview, November 2019). This corroborates the finding of Mondlane and Shoko (2003) who reported that the prime objective of local miners is to accumulate wealth and will not get on well with any decision that will limit them from achieving their target. In another interview session on the issue of why most miners strive to make it big.

Religious affiliation of respondents does not influence the source of spiritual assistance sought by miners as evidenced by the results in Table 3. The Pearson Chi-square (2.1) was not found to be significant (P-value = 0.35 > 0.05). This does not present enough evidence to reject the notion that religion does not influence the source of spiritual assistance miners seek. Hence, spiritual consultation depends on the previous successes of a particular spiritual father in gold mining exploits.

**Table 3. Religion and source of spiritual assistance in mining gold**

Religion	Source of spiritual assistance			Total
	Mallam	Prophet/Pastor	Fetish Priest	
Christianity	1 (25.0)	3 (75.0)	0 (0.0)	4 (100.0)
Islam	18 (22.8)	35 (44.3)	26 (32.9)	79 (100.0)
Total	19 (22.9)	38 (45.8)	26 (31.3)	83 (100.0)

Observation = 93, Pearson Chi-Square ( $\chi^2$ ) = 2.1, df = 2, P-value = 0.35

Source: Field Survey, 2019. Note: All figures in parentheses are percentages.

The results further indicate that respondents within the Islamic faith dominate in the study. However, respondents' demand for deific assistance is not fixed to any specific source. Respondents' sources of spiritual support vary from pastors, mallams, and fetish priests. These groups of spiritualists are believed to have supernatural powers and are often relied upon to fortify miners spiritually against evil and also make their explorations productive. Similarly, Sarpong (2010) and Sarpong (2015) demonstrated strong demand for rituals and spiritual fortifications although Christianity dominates in the Tarkwa Mine Region in Ghana. Of particular interest in Sarpong's study is the fact that educated persons subscribe to rituals to mine gold. This explains a strong connection between indigenous mining operations and the use of rituals in mining. It goes to buttress the arguments put forward by historical scholars regarding the indigenous nature of ASM operations. ASM activities for past decades have been flourishing on rituals and spiritual framings

in Ghana (Ofosu-Mensah, 2010; Addei and Amankwah, 2011; Awuah –Nyamekye and Sarfo-Mensah, 2012). However, much attention has not been accorded to the implication of these rituals and spiritual orchestrations on the environmental tragedies caused by local miners.

All respondents believe that gold has a spirit. From Table 4, 49.5% of the respondents liken the spirit of gold to a living creature while 32.2% refer to it as a Jinni. Furthermore, miners require specific sacrifices and prayers including the services of spiritualists to be able to attract the spirit of gold for a successful operation. The results relate well with the narratives of Awuah-Nyamekye and Sarfo-Mensah (2012) on underground miners within Obuasi and Prestea mines having to battle with some of these creatures such as dwarfs and live chickens alleged to be the spiritual custodians of the gold. This suggests the high demand for spiritual support in mining gold is influenced by the belief that metals such as gold are endowed with spirits (Whitehouse, 2002; Atiemo, 2010; Bryceson et al., 2010). However, these beliefs are classified as myths and superstitions which rarely influence scientific thinking (Addei and Amankwah, 2011). Notwithstanding the above, we argue in this study that the belief systems upheld by local miners conspicuously influence gold mining operations with the associated adverse effects such as land degradation.

**Table 4. Perceived nature of gold spirit and ways of attracting it**

Nature of gold spirit	Frequency	Percent
It is sometimes a human	17	18.3
It is a living creature	46	49.5
It is a Jinni	30	32.2
Total	93	100.0

Source: Field Survey, 2019.

It has become a norm for local miners to perform rituals before embarking on mining operations. The aim is to seek permission from the gods before obtaining their property (gold) (Ofosu-Mensah, 2010; Hirsech, 2017). Local miners share the notion that failure to perform the right ritual leads to several negative consequences. Miners attribute the frequent accidents, for example, pit collapse and fall to erroneous rituals performed by *Ghetto* owners.

This finding affirms that of Ofosu–Mensah (2010) who posits that local miners finance fetish priests and medicine men to perform rituals to enhance their

chances of getting plenty of gold in mining pits. As the road to success is being paved through spiritual undertakings, large tracts of virgin lands are being debilitated and remain useless for agriculture activities.

To pacify the gods to attract the spirit of gold, a bunch of items is usually required. About 77.4 % of the respondents indicated that the items they use in performing gold rituals are sensitive and sometimes difficult to access. Also, all respondents (100%) agreed with the view that local mining activities preclude some groups of individuals from getting in contact with the gold spirit.

A prominent miner (*ghetto* boss) supported the above assertion. This relation though not directly situated has confirmed the findings of Bryceson et al. (2010) and Sarpong (2015) on the ritual murder of albinos in Sukumaland, Tanzania and the mysterious death of Ghanaians around the 2000s in the Eastern Region ascribed to the handiwork of illegal miners in these two countries cases respectively. The findings seem to suggest that local miners are always in a state of “do or die” to make their operations profitable. Besides, indigenous miners follow strictly the dos and don’ts relating to the success of their activities. For example, women in their menstrual period are considered unclean and therefore not allowed to go closer to mining pits. Also, men are regulated on having sexual intercourse within a certain timeframe to have a prosperous mining operation. According to Ofosu-Mensah (2011), these kinds of observations are signs of bad luck to indigenous gold mining operators. It was further established that some days are set aside for ‘zero mining’ with the belief that the gods do come to inspect local miners’ footprints within those days. Interestingly, none of these rules are tailored towards reclaiming degraded lands caused by mining activities.

Results of the survey further suggest that the majority (62.4%) of artisanal and small-scale miners prefer mining to other jobs. They would therefore not accept any job that is not profitable compared to gold mining. The results also suggest that artisanal and small-scale miners have a strong desire to ‘making it big’ irrespective of the challenge. The results further revealed that local miners’ expectations go beyond meeting their basic needs of food, shelter, and clothes as often argued by most livelihood scholars in the ASM sector (Hilson and Clifford, 2010; McQuilken and Hilson, 2016). It demands that institutions tasked

to remedy the adverse environmental effects of the sector including land degradation look beyond the concept of providing local miners with alternative livelihoods. This is because local miners are not ready to accept any alternative livelihood activity that would not be rewarding relative to mining. The hidden fundamental factors including the role of rituals and spiritualists in land degradation caused by local miners should be recognized.

The forgone submission suggests that artisanal and small-scale miners see their activities as a do-or-die affair and will do anything possible to make their operations profitable. In connection to this, a Chi-square test was performed to determine whether local miners that have the opportunity of applying scientific or modern tools and methods in their operations still employ rituals and spiritualists to bless their operations. The Pearson Chi-square (2.142) was not significant ( $P\text{-value} = 0.343 > 0.05$ ) (Table 5). There is therefore no convincing evidence to reject the notion that the use of scientific tools and methods in mining is independent of the beliefs and practices of these local miners. Thus, respondents who use scientific tools and methods in mining still seek deific assistance. This has made it difficult to detach the influence of local mining beliefs and practices from the adverse environmental consequences caused by them. The success of local miners is strongly influenced by their beliefs and practices (Moretti, 2007; Hirsech, 2017) culminating in large tracts of land being used to mine gold in Ghana. Though the customs and practices of traditional land tenure preclude land degradation, the beliefs and practices of local miners failed to recognize the importance of protecting the land for sustainable development.

**Table 5. Use of scientific tools versus rituals in mining**

Use of scientific tools in mining	Rituals induce land degradation in mining		Total
	Yes	No	
Agree	52 (57.8)	3 (100)	55 (59.1)
Disagree	3 (3.3)	0 (0.0)	3 (3.2)
Neutral	35 (38.9)	0 (0.0)	35 (37.6)
Total	90 (100.0)	3 (100.0)	93 (100.0)

Observations = 93, Pearson Chi-Square ( $\chi^2$ ) = 2.142,  $df = 2$ ,  $P\text{-value} = 0.343$

Source: Field Survey, 2019. Note: All figures in parentheses are percentages.

Also, all the lead miners (*ghetto* bosses) share the notion that there is a strong nexus between miners'

beliefs and practices and land degradation. The results suggest that artisanal and small-scale miners are sustained in the business through the support they receive from their spiritual fathers. Most artisanal and small-scale miners would have ceased operating if they were not making gains. No gain would mean less or no land degradation. As posited by Fearon et al. (2015) the success of a local miner in a particular area attracts other miners increasing the negative environmental effects including land degradation.

All the respondents believed that failure to reclaim the land after mining has negative consequences. A vast majority (80.6%) of the respondents understood that their activities render the land useless for farming whilst 19.4% of the respondents admitted that animals and humans are sometimes trapped in mining pits. This implies that miners are aware of the harm they are causing to land but are not putting in place measures to reclaim it. Probably, this may be a result of the fact that their beliefs and practices do not prohibit mining without reclaiming the land. Away from this, the failure of illegal miners to reclaim the land is attributed to the weak institutional framework in Ghana (Fearon et al., 2015; Boadi et al., 2016). The majority of the institutions detailed to combat illegal mining activities are under-resourced, and largely under the whims and caprices of political heads, impeding smooth monitoring of ASM activities (Owusu et al., 2019). As such, local miners are not under any form of pressure (coercive or spiritual) to reclaim the land.

Moreover, about 75.5% of the local miners attached reverence to the land. To them, the land is a god that has the power to punish miners who fail to perform the right rituals. This implies that indigenous miners believed that the land should be able to punish primary land users who degrade the land. Land in northern Ghana is called *Tingbani* which translates to 'god of the land. As such, most land-based activities commence with sacrifice including the pouring of libation to honor the god (*Tingbani*) (Kpieta and Bonye, 2012). Artisanal miners appease the god of the land through rituals and offerings under the guidance of their spiritual fathers. Hence, deaths resulting from pit collapse, and other deaths of miners (which are difficult to explain in terms of cause) do occur when the lead miners (*ghetto* bosses) fail to honor certain promises by giving back to the god (*Tingbani*) its demands. This is consistent with literature (Addei and Ofosu-Mensah, 2010; Amankwah, 2011; Sarpong, 2015).



Even though the land has the power to punish miners, the punishment can be overturned by the miners' spiritual fathers as the majority of the respondents (75.3%) agreed that powerful spiritualists such as *mallams* can avert the punishment from the land; 49.5% agreed that a pastor can avert the punishment from the land; 75.3% agreed that a fetish priest can avert the punishment from the land; whilst 41.9% of the respondents believed that a juju-man (Voodoo) can help miners avert the punishment from land (Table 6). This implies that even though respondents practiced only Islam and Christianity, they are prepared to seek spiritual assistance from any source just to be successful in their gold mining exploits. The results further indicate that most miners have a strong belief in *mallams* and fetish priests as key spiritualists that can prevent or avert the punishment from *Tingbani* (god of the land). Hence, any spiritual punishment for abusing the land in the form of land degradation could be averted.

**Table 6. Spiritualists can help a miner prevent the punishment from the land**

Source of spiritual aid	Agree	Disagree	Neutral	Total
Mallam	70(75.3)	4(4.3)	19(20.4)	93(100)
Pastor/Prophet	46(49.5)	28(30.1)	19(20.4)	93(100)
Fetish Priest	70(75.3)	4(4.3)	19(20.4)	93(100)
Juju-Man	39(41.9)	18(19.4)	36(38.7)	93(100)

Source: Field Survey, 2019. Note: All figures in parentheses are percentages.

The results also suggest that spiritual workers have greater potential to determine the fortune of a small-scale miner. A known fetish priest consulted in connection with their role in assisting local miners. Literature has reported the role of spiritualists in local mining operations. [Sarpong \(2015\)](#) reported that the death of miners is sometimes influenced by the spiritual fathers leading to pit cave-ins. When such a situation occurs, the death of the miner is kept secret by fellow miners because the decomposing body would serve as a conduit to attract gold spirits leading to more wealth. An alleged issue of using the blood and body parts of albinos by local miners based on the advice of their spiritual fathers in Tanzania ([Bryceson et al., 2010](#)) adds more evidence to the commanding role of spiritual workers in the ASM sector. This suggests that ASM activities are being propelled by the spiritualists. In the case of Ghana, the dominance of spiritual workers has become common knowledge. It is usual to see these spiritualists on Television stations and social media platforms advertising and displaying their powers. As

a result, the entire cycle of ASM operations has been constructed under the knowledge of these spiritual fathers. It is therefore imperative to argue that the spiritualists may play a prominent role in forestalling land degradation caused by local mining activities. As such, they must be partly accountable for the unceasing land degradation caused by ASM operations in Ghana.

#### 4. Conclusion

Artisanal and small-scale mining operations are greatly influenced by beliefs and practices that are strongly associated with rituals and spirituality. Thus, deific assistance is considered a key factor that sustains local miners in their operations, resulting in massive land degradation. A local miners' decision to degrade a parcel of land is determined by the potential of obtaining a substantial quantity of gold. This is often followed by rituals based on the advice of their spiritual fathers (*mallams*, pastors, fetish priests, and juju-men). Local miners believe in the powers of their spiritual fathers to succeed in their operations which eventually leads to land degradation. However, on the consequential causes of land degradation by the miners, neither the state institutions nor the spiritual fathers may be able to strike a balance in addressing this problem. Local miners revered the land as a god, yet little attention is given to land reclamation after mining because their spiritual fathers can avert any negative consequences from the god.

To stem land degradation in Ghana's mining areas caused by ASM operations which are strongly rooted in traditional beliefs, practices, and rituals, this paper recommends the following:

- The government should speed up the processes of formalizing the operations of *galamsey* operators in the ASM sector in Ghana.
- The government, through the Environmental Protection Agency (EPA) and Minerals Commission, should create a geodatabase for all artisanal and small-scale miners, the spiritual fathers, and the operational zones in Ghana to track their activities.
- The government through the Metropolitan, Municipal, and District Assemblies in collaboration with the EPA and Minerals Commission should engage spiritualists who work for the miners in joint monitoring and regulation of the activities of artisanal and small-

scale miners. However, the government must compensate the spiritualists for their efforts.

- The government should hold artisanal and small-scale miners as well as their spiritual fathers responsible for land degradation in their operational zones.

**Competing Interest Statement:** None of the authors has any conflict of interest concerning this work.

**List of Abbreviations:** ASM: Artisanal and Small-scale Mining, EPA: Environmental Protection Agency, IGF: Intergovernmental Forum on Mining, IMCIM: Inter-Ministerial Committee on Illegal Mining, KII: Key Informant Interview, SDGs: Sustainable Development Goals, SPSS: Statistical Package for Social Sciences, UN: United Nations, UNDP: United Nations Development Programme.

**Author's Contribution:** I.B. contributed to the conception of the research idea, design, data collection and the initial draft of the manuscript. K.P. contributed to the design, review and editing of the manuscript. A.A. contributed to the data collection, review and restricting of the manuscript as well as editing.

**Acknowledgment:** The authors would like to extend our appreciation to Mr. Motin Bashiru and Mr. Inusah Adama Abu for the diverse support you offered during the field data collection. Moreover, authors extend sincere gratitude to the small-scale miners and their spiritual fathers in the Wa East District for granting us audience during this study.

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