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Transforming Ghana's ASM industry: The intersection of 'mining schemes' and stakeholder collaboration

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A B S T R A C T

Weak institutional frameworks related to artisanal and small-scale mining (ASM) operations have exposed many mineral-rich countries to negative environmental consequences. In Ghana, for example, mining-related environmental challenges led to a total ban on ASM activities in 2017. In light of this, the government of Ghana launched a programme dubbed the 'Community Mining Scheme' (CMS), premised on multi-stakeholder cooperation, as an alternative to illegal mining. Recently, however, the new (NDC led) government has disbanded the scheme, proposing to replace it with a new scheme – mining cooperatives – which are also expected to be operationalised by local mining communities and other stakeholders. Thus, this study employs a stakeholder analysis framework to examine the roles and agency of the various stakeholders expected to operationalise the framework and structure of the new scheme. We delineate ways by which mining authorities can tap into the synergies of the various stakeholders in order to achieve sustainable mining practices. We conclude by encouraging future research to go further to place the CMS discussion more accurately into the context of how far the project grew, and possibly explore the challenges that confronted the project, so as to provide insights that could either help reshape policy or refine ideas about the new 'mining cooperatives' scheme.

1. Introduction

Artisanal and small-scale mining (ASM) operations continue to serve as an engine of employment in most mineral-rich settings (Arthur-Holmes et al., 2022b; Banchirigah, 2008; IGF, 2017). Interest in ASM, particularly for gold, has risen due to the relatively high gold prices that make marginal gold deposits economically viable for ASM operators (IGF, 2017; Minerals Commission of Ghana, 2021). Also, interest in ASM has been stimulated by dwindling livelihood choices especially in mining communities (IGF, 2017; Minerals Commission of Ghana, 2021; Okoh and Hilson, 2011). However, as ASM has grown, so too have the associated social and environmental harms in the mining regions (Mantey et al., 2017; Ofosu et al., 2020). ASM is commonly defined as the extraction and processing of minerals through intensive labour and low levels of technology (Hilson, 2016, 2017). Due to its association with informality and the related environmental challenges, the operations are often viewed in a negative light by government officials and policy makers (Clifford, 2022; Ofosu et al., 2020).

But why is ASM highly associated with environmental challenges in many mineral-rich countries including Ghana? Two explanations can be offered. First is the geopolitics of natural resource endowment (Le Billon, 2004, 2008): whereas the extraction activities of point-source mineral resources (concentrated in a small area) can be fairly controlled by central and local governments, the diffuse nature of alluvial minerals, which are amenable to small scale extraction, makes it difficult for regulatory entities to control the miners of such minerals. This is especially the case in weak institutional contexts where there is lax enforcement of mining and environmental laws (Siwale and Siwale, 2017; Teschner, 2012). This culminates in the upsurge of illegal/-informal mining activities with its deleterious effects on the physical environment (Mantey et al., 2016; Ofosu et al., 2020).

The second explanation is a corollary to the first: studies have shown that the environmental degradation challenges associated with ASM are highly driven by the sector's informality due to inadequate regulation (Arthur-Holmes and Ofosu, 2024; Siwale and Siwale, 2017). This situation obviously requires the creation and implementation of a strict policy and regulatory framework by state institutions and by communities with large ASM sectors (Ofosu et al., 2020; Siwale and Siwale, 2017). Unfortunately, however, current mining policy and regulatory responses have tended to be inconsistent and ineffective and, in some cases, non-existent (Ofosu et al., 2020; Teschner, 2012; Veiga and Marshall, 2019). Such inferior institutional arrangements have led to unsustainable environmental management practices across the mineral-rich world including Ghana (Bansah, 2023; Ofosu et al., 2020).

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In light of the poor environmental performance of the ASM sector, the government of Ghana banned all small-scale mining activities in 2017 (Hilson, 2017; Ofosu et al., 2024b). However, many scholars argue, quite convincingly, that the environmental challenges have been occasioned by three main mechanisms: i) the rigid bureaucracies that must be navigated to legalise operations, ii) the high costs associated with securing permits, and iii) an acute shortage of available mineralised land to support prospective licensees (Hilson, 2017; Siwale and Siwale, 2017). The argument further claims that an increasing number of people are participating in illegal ASM operations because large-scale mining activities have driven displacement and rural injustices (Banchirigah, 2008; Hilson, 2017). Large-scale mining companies have taken up viable lands previously used by indigenous residents as a source of livelihood (Akabzaa and Darimani, 2001; Banchirigah, 2008). In this regard, state policies have become instrumental in advancing large-scale mining interests through institutionalised policies on land and resource access that tend to favour industrial mining operations (Hilson, 2019; Hilson et al., 2020). In this narrative, the ASM sector is but a particularly powerful illustration of the disorder, corruption, and institutional weakness that characterise mineral and mining governance (Geenen, 2012; Hilson, 2017; Ofosu, 2023; Siwale and Siwale, 2017; Teschner, 2012).

To address the problem of informality surrounding ASM and promote sustainable, environmentally-friendly mining practices, the government of Ghana launched a programme in 2019. Dubbed the 'Community Mining Scheme' (CMS), this initiative was aimed at encouraging local community participation in ASM (Aram et al., 2024; Arthur-Holmes and Abrefa Busia, 2021; Hilson et al., 2022; Minerals Commission of Ghana, 2021). Importantly, the launch of the CMS, the success of which hinged on multi-stakeholder cooperation, brought into sharp focus the agency of stakeholders in sustainable mining and environmental management practices. Recently, however, the new (National Democratic Congress (NDC)) led government has disbanded the CMS, proposing to replace it with a new scheme – 'mining cooperatives' – also expected to be operationalised by local mining communities and other stakeholders (myjoyonline.com, 2025; Starrfm.com.gh, 2025).

While the issue of stakeholder agency has a long history in the literature on environmental governance (Baddianaah et al., 2023; Osei-Kojo and Andrews, 2016; Reed et al., 2009; Tuokuu et al., 2019), it has recently been the subject of renewed, ample attention, notably due to discussions on how to properly deal with informal/illegal ASM and the associated environmental challenges in Ghana. Also, the focus on the agency of stakeholders has become more relevant considering that in September 2024, the then President of Ghana, Nana Akufo Addo, set up a ministerial committee to engage all stakeholders to assess the government's efforts in dealing with illegal mining (Arhinful, 2024; Ghanaweb, 2024a).

However, a critical analysis of the policy documents (see Minerals Commission of Ghana, 2021) reveals that the CMS, touted as premised on stakeholder engagement, failed to account for and to find room for the engagement of some of the stakeholders in the ASM sector. Also, while the document found room for the incorporation of oversight members, the various roles of these members and the particular ways in which the stakeholders could help realise the success of the scheme were not comprehensively addressed. Thus, with a new 'mining cooperative' scheme being proposed, this study aims to provide a comprehensive profiling of the various stakeholders and explore how their expertise and synergies could be harnessed for the successful implementation of the scheme. We do so by asking several questions: 'Who are the stakeholders'?, 'What are their needs'?, and 'In what ways can they help in the attainment of sustainable mining practices as was envisioned by the CMS and as would be envisaged by the new 'cooperative scheme'?

The rest of the study is structured as follows: Following the introductory section, we present a brief reflection on the nature of ASM operations and the associated environmental challenges. After this, the dynamics of the CMS is highlighted. Next, the stakeholder framework is presented. The penultimate section analyses the relevance of the stakeholders to the newly-proposed scheme, while the final section offers a discussion and a conclusion.

2. ASM in Ghana: a brief reflection on the nature of operations and environmental challenges

The discovery and relative abundance of natural resources, especially gold, in Ghana continues to shape the contours of the political economy and the environmental history of the country in manifold ways (Akabzaa and Darimani, 2001; Hilson, 2002a, 2002b). Ghana is generally not considered as the quintessence of a country plagued by a *resource curse* - the conundrum of mineral abundance leading to poor socio-economic growth and conflict - despite the availability and exploitation of its extensive natural resources (Lawer et al., 2017). This has mainly been attributed to its stable political system, the relatively diversified nature of its economy, and the vibrancy of its civil society organisations, which give it a structural immunity against the resource curse (Kopiński et al., 2013). Ghana has also managed to prevent the break out of armed and secession conflicts over the extraction of its resources and the appropriation of its revenues (Kopiński et al., 2013; Lawer et al., 2017), although such destructive conflicts are usually present in most resource-endowed countries especially in Africa and Latin America (Ross, 2004a, 2004b). However, with over 85 % of small-scale mining operators extracting illegally (Patel et al., 2016), and the licensed operators not heeding environmental regulations (Botchwey et al., 2022; Teschner, 2012), small-scale mining has subjected Ghana to some socio-environmental challenges (Arthur-Holmes and Abrefa Busia, 2022; Siaw et al., 2023, 2025).

Studies have revealed that the sector continues to grow; it has evolved from its days of obscurity to become an important driver of socio-economic development, serving as a viable source of employment for most inhabitants in mineral-rich settings (Minerals Commission of Ghana, 2021; Ofosu and Sarpong, 2023, 2022; Okoh and Hilson, 2011), including women (Arthur-Holmes, 2021; Arthur-Holmes and Abrefa Busia, 2022; Ofosu et al., 2024a; Zolnikov, 2020). It is estimated that the sector accounts for about 40 per cent of Ghana's gold production (Ghanaweb, 2024b); ASM employs an estimated one million people in Ghana, and supports approximately 4.5 million more (Ghanaweb, 2024b; Hilson, 2017). The sector also contributes to foreign exchange earnings and provides pathfinder clues for the discovery of large deposits, making it one of the nation's most important economic activities (Ghanaweb, 2024b; Hilson, 2017; Hilson and Garforth, 2013; McQuilken and Hilson, 2016).

Notwithstanding the enormous socio-economic benefits, however, the sector is responsible for several environmental challenges. Mining in general, and ASM in particular, is widely regarded as one of the most hazardous occupations and with good reason (Arthur-Holmes and Abrefa Busia, 2022; Mantey et al., 2017). Studies have shown that ASM operations have caused a disproportionate amount of damage to lands in many parts of the country (Asiedu-Amoako et al., 2016; Boateng et al., 2014; Mantey et al., 2016). This has led to the rapid erosion of the foundations of livelihood, especially in the agrarian economy (Ofosu et al., 2020; Schueler et al., 2011). River bodies have also not been spared their share of ASM-related contamination and pollution (Bansah and Bekui, 2015; Citifmonline.com, 2017a, 2017b; Eshun, 2017). These environmental problems, for example, led to the mining ban in Ghana in 2017.

Research has, however, long shown that these problems have been engendered, first, by the failure of the mining governance regime to properly formalise and monitor the sector (Hilson, 2016; Teschner, 2012). The long and bureaucratic process of obtaining a licence to operate legally, and the high licensing fees have discouraged most miners from formalising their operations (Aryee et al., 2003). Others argue that informality within ASM with the associated environmental challenges persists due to the display of practical norms enacted by a

variety of political actors with competing political and material interests (Ofori et al., 2021). To help address these socio-political and environmental issues associated with ASM, the government of Ghana launched the CMS, premised on multi-stakeholder cooperation, as an alternative to illegal mining.

3. The Community Mining Scheme (CMS)

In light of the developments highlighted above, the government of Ghana launched the CMS in 2019 (MLNR, 2019). The project was designed to help create opportunities in mining for indigenous people in mining communities and to curb the menace of illegal mining (Hilson et al., 2022; Minerals Commission of Ghana, 2021). The scheme aimed to tackle illegal mining by encouraging locals to undertake responsible, viable, and sustainable ASM under the aegis of the Minerals Commission of Ghana, 2021 (Act 703) (Minerals Commission of Ghana, 2021). In this sense, the CMS was part of formalisation efforts of informal gold mining in Ghana (Arthur-Holmes et al., 2022a, p. 213). Vazquez-Brust et al. (2024) added that the CMS was initiated based on moral and ethical principles to help informal miners be responsible for their actions that tend to damage the environment (p. 19).

Aimed at creating at least two million jobs across the country, at its base, the project bid to ringfence specific areas for licensed ASM and to ensure mining communities owned concessions (Hawkson, 2022; Hilson et al., 2022). The scheme was also designed to help improve the working conditions of the operators (Minerals Commission of Ghana, 2021). In this regard, the scheme combined i) ASM in accordance with the Minerals Commission of Ghana, 2021 (Act 703), and ii) the Tributer System in accordance with Regulations 493–506 of the Minerals and Mining (Health, Safety and Technical) Regulations, 2012 (L.I 2182).

The CMS consisted of over a hundred mining cooperatives in *galamsey*-prone areas (MLNR, 2017). The bulk of members of these cooperatives were trained ASM operators from the George Grant University of Mines and Technology (GGUMaT). These miners were to be assisted by the Minerals Commission to obtain portions of demarcated small-scale mining zones. In addition, adequate monitoring systems, including the establishment of district mining committees, had been put in place in the various mining districts (MLNR, 2019).

Recognising the CMS as a good opportunity to create employment avenues for miners, some District Assemblies submitted applications to the Minerals Commission for allocation of mineralised lands (Hilson et al., 2022). Importantly, these applications sought to cover all of the fees associated with a licence with a view to seeking to remove some of the most significant barriers, i.e., costs and bureaucracy, to formalising ASM in the country (Hilson et al., 2022). More important to the discussions in this study is the fact that the community mining projects were to be coordinated and managed by stakeholders in the ASM sector (MLNR, 2017). But several questions arise: Who are these stakeholders? What are their needs? What are their power and interest levels? And how can the government of Ghana effectively leverage their synergies in the march towards sustainable mining?

Here it is very important to state that the policy document (operation manual) establishing the CMS allowed for the incorporation of stakeholders in the form of the 'Community Mining Oversight Committee' (Minerals Commission of Ghana, 2021). The committee members were supposed to be appointed by the Minister responsible for Mines and were to serve for a period of three years (Minerals Commission of Ghana, 2021). The committee was comprised as follows.

i) All members of the Small-scale Mining Committee as stated in section 92 of the Minerals Commission of Ghana, 2021 (Act 703)
ii) the following and others may be co-opted:
a) a representative of the Water Resources Commission
b) a representative of the Forestry Commission
c) a representative of the Divisional/District Police Commander
d) a chief of the relevant community
e) M.P of the area

Referring to the Minerals Commission of Ghana, 2021 (Act 703), the Small-scale Mining Committee members under section 92 included the District Chief Executive or his/her representative as the chairperson of the Committee, the District Officer of the Minerals Commission, one person nominated by the relevant District Assembly, one person nominated by the relevant Traditional Council, an officer from the Inspectorate Division of the Commission, and an officer from the Environmental Protection Agency (Minerals and Minerals Commission of Ghana, 2021).

A critical look at the list of members mandated to supervise the CMS revealed that some of the stakeholders in the Ghanaian ASM sector had not been identified. For example, stakeholders such as formal small-scale miners, farmers/landowners/local residents, academic institutions etc. had not been identified and assigned specific roles. Even when the stakeholders had been identified under the Minerals and Mining Act, the particular ways by which the stakeholders could help realise the success of the scheme were not comprehensively addressed. The document stated that Committee members shall, in conjunction with the Minerals Commission, have oversight responsibility over the CMS. However, 'oversight responsibility' appears vague, as neither 'oversight' nor 'responsibilities' were defined.

As stated earlier, the CMS has now been disbanded by the new government with one of the reasons being that "community leaders were not involved by the previous administration in the CMS" (Starrfm.com.gh, 2025). According to the new government, a task force was instituted to investigate the CMS. The task force visited communities where small-scale mining occurs and engaged with those involved in the CMS. The report suggests that, in certain instances, some communities did not participate in the CMS; instead, it was largely private companies that were effectively operating under the guise of community mining (Starrfm.com.gh, 2025). Hence, a new scheme has been proposed to replace the CMS. This new scheme would also be managed by stakeholders and local communities. Thus, in order to help the new scheme achieve its purpose of sanitising the ASM industry, we seek to examine ways by which the knowledge and expertise of the stakeholders can be harnessed. We do this examination through the lens of the concept of 'stakeholder analysis'.

4. Stakeholder analysis

Stakeholders are taken to be any individual, group, and institution that would potentially be affected, whether positively or negatively, by a specified event, process, or change (Gass et al., 1997; Kujala et al., 2022; Shackleton et al., 2019). Van Ingen et al. (2009) adapted the definition of stakeholders from the EU Project Cycle Management Manual (2001) to define stakeholders as any individuals, groups of people, institutions (government or non-government), organisations, or companies that may have a relationship with the project/programme or other intervention at stake. They may – directly or indirectly, positively or negatively – affect or be affected by the process and/or the outcomes (Van Ingen et al., 2009). According to Crane and Matten (2007), stakeholders are individuals or groups that, in the context of a specific situation, are either harmed by, or benefit from, a project/corporation, or whose rights the managers of projects/corporations should respect.

According to Reed et al. (2009), stakeholder analysis is a process that i) defines aspects of a social and natural phenomenon affected by a decision or action; ii) identifies individuals, groups, and organisations who are affected by or can affect those parts of the phenomenon; and iii) prioritises these individuals and groups for involvement in the decision-making process. Stakeholder analysis is an approach for understanding a system by identifying the key actors in the system, and assessing their respective interests in, or influence on, that system (Brugha and Varvasovszky, 2000; Mayers, 2005). The stakeholder analysis framework is a methodology used to facilitate institutional and

policy reform processes by accounting for and often incorporating the needs of those who have a 'stake' or an interest in the reforms under consideration (Kujala et al., 2022; Mayers, 2005; Reed et al., 2009). With information on stakeholders, their interests, and their capacity to oppose reform, reform advocates can choose how best to accommodate them, thus ensuring the policies adopted are politically realistic and sustainable (Kujala et al., 2022; Reed et al., 2009). It is about asking questions like: Whose problem is it? Who benefits? Who loses out? What are the power differences and relationships between stakeholders? What relative influence do they have? (Mayers, 2005).

Stakeholder power analysis is particularly useful for assisting in decision-making situations where various stakeholders have competing interests, resources are limited, and stakeholder needs must be appropriately balanced (Kujala et al., 2022; Mayers, 2005). The analysis enhances the concept of stakeholder participation; this, in turn, develops trust and openness, both of which are important ingredients in the successful implementation of policies (Osei-Kojo and Andrews, 2016). Stakeholder analysis, and the associated practice of stakeholder participation, is a prime avenue for addressing challenges that relate to a wide range of actors because it offers the opportunity for all the actors to make contributions towards the larger discourse of finding solutions to social-environmental challenges (Baddianaah et al., 2023; Reed et al., 2009).

5. Stakeholders in Ghana's ASM industry

The ASM sector in Ghana has a wide range of stakeholders, all of whom can be regarded as agents of transformation (McQuilken and Hilson, 2016). All the stakeholders are working with different goals in mind and all have differing needs and responsibilities (McQuilken and Hilson, 2016; Osei-Kojo and Andrews, 2016). To ensure fully effective and participatory ASM sector reform, especially under the new mining cooperative scheme, there is a need to utilise the synergies and agency of these actors.

For the purposes of this study, the toolkit categorisation of stakeholders by Van Ingen et al. (2009) is adopted since it fittingly captures the different actors involved in the Ghanaian ASM industry. The stakeholders in the mining sector in Ghana can be categorised as 'primary', 'secondary', and 'key' stakeholders. The primary stakeholders are those ultimately affected, either positively (beneficiaries) or negatively by the small-scale mining operations in the various communities. In the Ghanaian context, these stakeholders include illegal small-scale miners, legalised small-scale miners, landowners, farmers, local residents. These groups of people do not wield much power or authority, but they are most directly affected, socio-economic or environmental-wise, by the operations of ASM.

The secondary stakeholders are those that possess a considerable amount of power and influence, which can be channelled to make reforms in the mining sector. These include non-governmental organisations (NGOs) and civil society organisations (CSOs), the media, and the Ghana Chamber of Mines. These stakeholders are the 'intermediaries' (van Ingen et al., 2009) that can help effect much needed changes.

The key stakeholders are those who possess the constitutionally mandated power and are well equipped to monitor, regulate, and sanitise the mining sector. These include the President of Ghana functioning through the Ministry of Lands and Natural Resources and its prime agency - the Minerals Commission, and District Chief Executives (DCEs).

The following paragraphs analyse the importance and roles the various stakeholders could play in the quest to find sustainable solutions to the problems affecting mining operations in Ghana. These roles are ultimately aimed at ensuring that ASM operations are formalised, and the activities therein are regulated and monitored under the newly proposed mining cooperative scheme.

5.1. Primary stakeholders

5.1.1. Illegal miners

Illegal/informal miners – those operating without the required mining licences – are primary economic beneficiaries of ASM (Andrews, 2015; Banchirigah, 2008). Their operations, however, leave the environment polluted and degraded (Siaw et al., 2023, 2025). The miners also face serious health problems due to the environmentally hazardous conditions in which they work (Arthur-Holmes and Abrefa Busia, 2022). In the broader context, the miners are often perceived as 'environmental criminals' (Tschakert and Singha, 2007). However, the criminalisation of the illegal ASM sector robs the miners of their agency to articulate and then solve the environmental problems they cause and experience (Tschakert and Singha, 2007). As succinctly expressed by one illegal miner in the study by Osei-Kojo and Andrews (2016):

> If government were to interact with us well and proper measures are put in place, Ghana will do well with small-scale mining … (p.9)

The new scheme, therefore, presents a fresh opportunity for the government to take a different approach towards the interaction with miners. As has been extensively discussed elsewhere, criminalisation has never worked to eliminate illegal mining (Hilson, 2017; Ofosu et al., 2024b; Osei et al., 2021). A good government-miners interaction, then, entails abolishing the current criminalisation policies directed towards ASM operators. Hence, with regard to the new scheme, the government can provide the district assemblies with the necessary technical and financial support to enable them identify illegal/informal miners. Once identified the miners can be registered, trained in sustainable mining practices, and employed as, at least, the base workers of the scheme.

5.1.2. Land owners/farmers/local residents

These stakeholders are directly or indirectly involved in ASM operations. Some of them are known to willingly sell their lands to mining operators for economic reasons (Myjoyonline.com, 2017; Siaw et al., 2023). However, while some of these landholders have had their lands encroached on by illegal miners, others have turned their farms into illegal mining sites (Arthur et al., 2016; Siaw et al., 2023). The state institutions can therefore tap into the relevant knowledge of these stakeholders. This is because these stakeholders are mostly in tune with the prevailing dynamics of ASM operations in their communities and have valuable knowledge to contribute to the attainment of a better mining scheme.

Reclaiming/remediating mining sites (Damptey et al., 2020; Mensah et al., 2022; Mensah and Addai, 2024) will be essential under the new scheme, and local community participation in reclamation projects could feature prominently. The aforementioned stakeholders can be employed in various phases of reclamation exercises in order to ensure that the lands are put back to good use after the life of the mine. This includes the supply of seedlings and the maintenance of soil conservation. It is thus appropriate to suggest that the managers of the new scheme together with the management and officers of the Environmental Protection Agency (EPA) encourage local stakeholders to establish community nurseries or private nurseries to produce the much-needed resources for reclamation purposes. While this would create employment opportunities for the stakeholders, it would also encourage them to safeguard the success of the programme (see Asiedu, 2013). The stakeholders can also be trained in the production of compost which can be employed for reclamation exercises. This should not be difficult to achieve, as most of these communities produce enough waste that can be turned into compost (Asiedu, 2013).

5.1.3. Legalised small-scale miners

They are directly involved in ASM activities (Botchwey et al., 2022). It has, however, been noticed that their activities usually do not conform to the prescribed environmental regulations (Botchwey et al., 2022; Teschner, 2012). Hence, their umbrella association – the Ghana National

Association of Small-scale Miners (GNASSM) - should be given key performance indicators (KPIs) in the assessment of their operations. Under the new mining scheme, the GNASSM can collaborate with the district assemblies so that their members can be allocated lands since they already have the capacity and the equipment to undertake mining activities. To contribute to more sustainable livelihoods in the mining communities, the land allocation arrangement could come with the condition that management of the operations 'localise' the required labour. This means that a percentage of the working staff should comprise members of the local mining communities, and the trained, previously informal, miners.

5.2. Secondary stakeholders

5.2.1. The media/non-governmental organisations (NGOs)/Civil society organisations (CSOs)

The role of these stakeholders as useful agents of education and communication on issues of national importance has been crucial in the 'fight' against illegal mining. It is remarkable that the Ghanaian media especially has been instrumental in the #StopGalamsey launch (Kpienbaareh et al., 2021). In the ASM discourse, however, the media seem to depict the operations majorly as an environmentally-destructive activity, thereby stigmatising ASM (Hilson, 2017; Sojková, 2022). This insistence on the institutional absences of ASM zones has dovetailed with a lack of media attention paid to some of the responsible and 'golden' practices taking place in ASM settings. Research works and other reports elsewhere have indicated that some ASM operators can be responsible miners (Ofosu et al., 2022, 2025; Ofosu and Sarpong, 2023; Zavala, 2017). These 'responsible' practices, however, seem to escape the attention of the media. The launch of the CMS, for example, in relative terms, received less attention than the StopGalamsey project. While the media and academic papers intensely highlighted the StopGalamsey initiative (Sojková, 2022; Spassov and Agbozo, 2019), the CMS did not receive similar attention (Hilson et al., 2022). It is therefore important that the media highlight the mechanisms through which responsible mining activities have been achieved elsewhere so as to educate and inform miners as well as the governance policy.

In addition, very useful empirical works and their allied recommendations have highlighted the complexity of mining relevance in rural areas. These works disrupt the singular narratives of 'bad ASM' more broadly. Works by prominent ASM scholars, prime among them Gavin Hilson, have done much to inform the global ASM debate on the positive outcomes of ASM activities and investments and their consequences for the ASM industrial landscape (Hilson, 2016; Hilson and Garforth, 2012, 2013). These works have also highlighted how inappropriate regulatory and policy frameworks are engendering and exacerbating informal operations in the ASM zones (Hilson, 2009, 2016). Unfortunately, however, these works also appear to have escaped the attention of the media.

Under the new scheme therefore, the media, NGOs, and CSOs would do well to disseminate information from published empirical ASM studies and reports so as to shape policy. Responsible mining operations exist, and their operations should not be left on the back burner. In addition, the media must exert its agency to coerce government to restructure its own inefficient mining governance regime (see, for example, Hilson, 2017). Criminalising the miners alone would not bring about the needed sustainable solutions (Ofori et al., 2021).

Going forward, the NGOs and CSOs can help in land remediation efforts by organising workshops and other programmes to educate miners on the need to engage in land remediation practices. NGOs and CSOs can also find innovative ways to partner with corporate organisations to raise the needed funds and resources to assist in land remediation efforts. This would help forestall any environmental degradation challenges that would be associated with the new scheme.

5.2.2. Academic institutions

Obviously, the mining cooperative project cannot succeed without policy monitoring and evaluation. Attaining a significant outcome in the new project requires the planning and implementation of relevant policy guidelines as well as constant monitoring and evaluation. The academic institutions/universities can therefore monitor the project and provide research and policy documents that highlight the 'successes' and 'challenges' of the scheme.

5.2.3. The Ghana chamber of mines

The Chamber of Mines is the umbrella association of large-scale mining companies and is therefore a relevant stakeholder in the sustainable-solution mechanisms concerning ASM operations. In this sense, it has a duty to promote good working relationships with ASM operators. It is well known that most large-scale mining operators already possess mining zones that are suitable for ASM operations (Aubynn, 2009; Teschner, 2013). Thus, the managers of the new scheme can consider the positive opportunities that may emerge by allowing ASM operators to utilise large-scale mining-titled concessions. The arrangements however should also be made to yield concrete economic/financial benefits to the large-scale mining companies whose concessions the ASM operators work. The large-scale mining companies can receive a share of the proceeds from the mining operations.

5.2.4. Traditional rulers (chiefs)/family heads

In Ghana, chiefs play a very important role in the mining sector because they oversee compensation processes and lead negotiations concerning land transfers to companies (Boafo et al., 2019). Even more importantly, perhaps, traditional chiefs and family heads are seen by the rural inhabitants as figures of authority (Abrefa Busia and Adjei, 2022; Adjei et al., 2017), despite mineral rights being invested in the presidency (Boafo et al., 2019). They are, therefore, one of the important stakeholders whose powers can appropriately be directed to help in the success of the mining cooperative scheme.

It is worth noting that the Minerals Commission of Ghana, 2021 (Act 703) stipulates that chiefs should be made members of the District Mining Committees. However, this role is not sufficiently prominent considering the enormous powers chiefs enjoy in their traditional jurisdictional areas (Boafo et al., 2019). They could therefore be actively engaged by the Ministry of Lands and Natural Resources in the processing of applications for mineral rights (see, for example, Baddianaah et al., 2023). As explained by a chief in the study by Osei-Kojo and Andrews (2016), the interaction between the regulatory authorities and the chiefs is not strong enough:

> I will say my relationship with the implementers is average; we do talk occasionally but not that often. Apart from me seeing them at conferences, seminars and also when a mining company is coming to work here, I do not hear anything from them. (p.8)

The chiefs and family heads can be very useful to the successful implementation of the cooperative scheme in two main ways: i) they can work closely with the district assemblies in the negotiation for and release of mineral-rich lands to ASM operators under the scheme, and ii) they can organise the local community members to undertake reclamation exercises so as to restore the lands to their original state, post mining. The role of the chiefs and family heads can be incentivised by them receiving a percentage of the earnings from the mining cooperative operations.

5.2.5. International organisations

Ghana has received international support for its formalisation initiatives and intervention since the enactment of small-scale mining regulations in the late 1980s. World Bank, Gesellschaft fiir Technische Zusammenarbeit (GTZ), and the United States Department of State, for example, have provided diverse forms of support to formalise the sector. In the 1990s, GTZ offered technical assistance for small-scale mining

licensing and other formalisation guidance (see Hilson et al., 2022). Due to their commitment to formalisation of informal ASM in developing countries, including those in Africa, World Bank has offered funding to assist the government towards the cost of Ghana Landscape Restoration and Small-Scale Mining Project (GLRSSMP) (Hilson et al., 2022; World Bank, 2024).

In this vein, if the government has yet not engaged international organisations as secondary stakeholders, they can do so to increase the coverage and address any challenges that may arise from the implementation of the new scheme. For instance, as GTZ has done in the past, providing technical assistance through training and researching the feasibility of other ASM methods of operations can help ensure the effectiveness and sustainability of the new cooperative initiative. For Ghana's quest to contribute to achieving the Sustainable Development Goals (SDGs) that are related to the ASM industry, international organisations, including donors that champion the social, economic, and environmental dimensions of sustainable development, should be welcomed as secondary stakeholders for the effective implementation of the cooperative scheme.

5.3. Key stakeholders

5.3.1. The government and the Ministry of Lands and Natural Resources

These are the prime agential participants in the formulation and implementation of the extractive and environmental planning policy. All mineral rights in Ghana are vested in the presidency (Minerals Commission of Ghana, 2021 (Act 703)). Therefore, the central government and the relevant ministries have the ultimate oversight responsibility to ensure that mineral exploration in Ghana is done in conformity with the rules and regulations in place. Effective enforcement of the mining regulations is extremely important, since the absence of an effective regulatory framework and environment governance would make it nearly impossible to achieve sustainable environmental solutions (Teschner, 2012). However, there has been evidence to suggest that the government and the ministries have been lax in the performance of their duties (Hilson, 2017). Cases of corruption have also been reported on the part of government officials relating to mining procedures (Ayelazuno and Aziabah, 2023; Ofori et al., 2021). There is therefore the need for a strong political commitment to punish mining officials who would be found to have engaged in acts of corruption related to the cooperative scheme.

Also, with regard to the new scheme, the government can involve the district assemblies in the coordination and administration of the scheme, and can establish a decentralized platform to ensure the smooth running of the scheme. The Geological Survey Authority (GSA) should be well equipped to ensure the provision of geological data to the managers of the scheme and miners. Thorough prospecting of mineralised lands is required to determine the extent and tonnage of mineral ores, and the GSA can be very useful in this regard. Their activities would go a long way in helping the managers and miners explore mineral deposits. In addition, due to the environmentally-destructive nature of mining operations, reclamation of mined out lands is of extreme importance. Thus, reclamation projects should be built into the new scheme. The government can set up the necessary funds and provide the appropriate personnel to help in the remediation of lands that will be affected.

5.3.2. District Chief Executives (DCEs)/District assemblies/assembly members

Since the DCEs are members of the District Mining Committees, and it is part of their duties to monitor small-scale mining operations in their areas of jurisdiction, they could be given KPIs to measure how effectively they are able to monitor the operations of the new scheme.

5.3.2.1. Assembly members. These are the locally elected representatives from the local government electoral areas and are therefore very important stakeholders in the ASM discourse. As members of the district assembly, they are enjoined by the Local Government Act to maintain close contact with and to consult with the people of the electoral area on issues to be discussed in the district assembly and collate their views, opinions, and proposals. This function is crucial because it places these members in the sphere of useful chains and links between the operators of illegal mines and the local government system. The assembly members could therefore be made to take an active role in identifying local community miners. These miners can then be registered and employed by the district assemblies under the cooperative scheme.

Here, it is worrying to note that some of the mining equipment seized from ASM operators during the ban on ASM had been burnt (Hilson, 2017; Ofosu et al., 2024b). The bulldozers and excavators could have been kept by the district assemblies and employed for other productive use like mineral excavation and the refilling of mining-degraded lands. However, districts which are still in possession of some of these pieces of mining equipment can lease the equipment to the managers of the new scheme in order to put the equipment to productive use.

6. Discussion and conclusion

In Ghana, mining operations have engendered negative environmental challenges leading to an ailing environmental health. This caused outrage with the Ghanaian media, civil society organisations, and a large section of the citizenry calling for a total ban on ASM activities (Sojková, 2022). The government heeded the call and consequently imposed a total ban on small-scale mining operations in 2017 (Hilson, 2017; Ofosu et al., 2024b). The government envisioned the ban to be important as a way of creating the necessary platform for the renewal and the transformation of ASM (Eduful et al., 2020; Ofosu et al., 2024b; Osei et al., 2021). Most reports, including the majority of public opinion, backed the action of the government. However, the government's action failed to take account of the fact that the illegal mining situation has been occasioned by mechanisms such as the rigid bureaucracies, the high costs associated with obtaining permits, and the acute shortage of mineralised land available to ASM operators (Eduful et al., 2020; Hilson, 2017).

To address the problem of informality and promote sustainable mining practices, after the ban, the government launched the CMS. The project was touted as having the potential to create the decentralized systems required to coordinate the formalisation, regulation, and implementation of support services to ASM effectively (Hilson et al., 2022). Based on their research in Prestea-Huni Valley District of Western Region, Arthur-Holmes et al. (2022a) emphasised that the CMS had potential to challenge the large-scale mining 'bias' and address the galamsey challenge that contributes to the increasing impact [of informal gold mining] on the environment, especially on water resources.

The success of the CMS project, importantly, hinged on multi-stakeholder cooperation. Recently, however, the new government has disbanded the CMS, and proposed instead to replace it with a new scheme - 'mining cooperatives'. This scheme is also expected to be operationalised by local mining communities and other stakeholders (myjoyonline.com, 2025; Starrfm.com.gh, 2025). In this vein, the agency of the various stakeholders should now be channelled to ensure the success of the new scheme. With reference to this, we suggest that, at the primary level, illegal miners could be properly identified, registered, and made to serve as the base workers of the scheme. Local residents can help in land reclamation/remediation processes. The EPA can team up and encourage local community residents to establish community nurseries or private nurseries to produce the required resources for land and environmental reclamation purposes.

On the secondary level, large-scale mining companies can help release parts of their concessions suitable for small-scale mining to ASM operations under the scheme, with local chiefs taking an active mediating role in the allocation of such lands. To minimise the hazard of

water pollution and ensure that the new scheme does not follow the environmental pollution trajectories of illegal mining, the Water Resources Commission can collaborate with the managers of the scheme to construct water ponds and tailing storage facilities at the mining sites to help in the processing of mineral ores.

Also, miners should receive geological survey support to determine the extent of the mineral reserves. Here, one key question worth throwing into the mix is 'How can technology help improve small-scale mining operations to achieve sustainable mining practices under the scheme?' Because mining policies generally overlook the concept of mineral depletion and exhaustion, technical support to determine the extent of mineral reserves is usually not provided to miners. However, mineral resources are non-renewable, and eventually, the ores in the mineral-rich lands that will be allocated to the miners under the scheme will be mined out. Therefore, if the ground or mineral concessions are not properly prospected, and insufficient exploration is conducted to determine the volume and tonnage of the underground mineral riches, the miners, in the end, will exploit the land haphazardly without any professional guidance or input and will assume that the mineral resources are exhausted (Ofosu and Sarpong, 2022). In Ghana, for example, many large, formalised mining companies (for example, GoldFields Ghana, Kibi Goldfields, AngloGold Ashanti Iduapriem) have been working on the same concession for several decades. These companies are able to mine these concessions and discover new areas of mineralisation because they invest in technological improvements in exploration in order to maximise the rate of discovery of mineral ores and to minimise discovery costs. Therefore, in seeking to sustain and promote the new mining scheme as a sustainable livelihood activity, managers of the project would need to address the issue of the provision of technology for mineral exploration in order to improve the length of time the miners can mine a particular concession. The technology and training facilities should strategically be targeted at assisting miners to move beyond alluvial workings and position them to target more complex primary deposits located underground.

Further, we also note that ASM operators would need to undergo formal training regarding mining operations in order to minimise the high occupational hazards associated with the operations (see, for example, Stemn et al., 2021). Thus, moving forward, the DCEs and the district assemblies could advocate for the establishment of ASM training schools in district mining centres across the country. The GGUMaT has the primary responsibility to offer training to miners, but it is located in Tarkwa in the Western Region, which is far away from most of the mining districts. Thus, the university may not be accessible to most miners, especially new ones, who especially require training. To minimise the cost of training the trainers, we propose that the mining authorities tap into the knowledge and expertise of retrenched mining engineers and other skilled workers who have had previous employment connection with local large-scale and small-scale mines.

Formal lessons on ASM operations could also tie in with lessons on income diversification and investment. This is important considering the finite nature of minerals, and the 'hot money' and profligate spending syndrome associated with ASM operators (Ofosu and Sarpong, 2022; Walsh, 2003). The finite and depletable nature of minerals means that, even in the best of circumstances, miners would be rendered jobless in the short and medium term. Miners should therefore be educated on the need to take advantage of the potential economic multiplier effects of ASM. This includes the need to make savings from their incomes in order to invest in more sustainable economic ventures such as property, transport, agriculture, and commerce.

As with most research, this study has limitations that can be addressed by ASM scholars and policymakers. Primarily, this present study is a policy analysis work. Thus, focused qualitative and quantitative studies on the workings and the socio-economic and environmental implications of, for example, the CMS could complement our work and tease out further dynamics of the project. Since the launch of the CMS in 2019, the study by Hilson et al. (2022) has explored in detail the potential 'promises' of the project to help transform the governance of ASM in Ghana. Other studies have supported similar and additional promises for sustainable and responsible mining practices (Arthur-Holmes et al., 2022a, 2022b; Vazquez-Brust et al., 2024).

Meanwhile, the CMS operated for years, with reports elsewhere suggesting good progress as well as potential pitfalls of the project. On the potential pitfalls, for example, reports indicate that the Ghana Medical Association had criticised the CMS, calling it a mere cover for the perpetuation of illegal mining activities in the country (Modern Ghana, 2024). According to the GMA, much of the destructive impacts of illegal mining were happening under the guise of the CMS (Modern Ghana, 2024). The problem, according to the GMA, was attributable to a lack of proper supervision of the project (Modern Ghana, 2024). Elsewhere, a study conducted in Tarkwa Nsuaem Municipality showed that despite the CMS being a new mining scheme, it had not addressed the old problems of informal underground gold miners experience, specifically the workplace risk factors and health challenges (Aram et al., 2024).

Surprisingly, however, most ASM scholars remained silent on other important issues such as, for example, the employment generation dynamics of the CMS. Hence, we believe the CMS picture was incomplete, with large parts of the landscape remaining outside the focus of scholarly attention. In this regard, we encourage future research to go further to place this discussion more accurately into the context of how far the CMS grew and possibly to explore the challenges that confronted the project so as to provide insights that can either help reshape ASM policy or refine ideas about the newly-proposed mining cooperative scheme.

CRediT authorship contribution statement

George Ofosu: Writing – review & editing, Writing – original draft, Validation, Investigation, Formal analysis, Conceptualization. **Francis Arthur-Holmes:** Writing – review & editing, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

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