

Cohered emergent theory for designing and implementing multinational mining sustainability practices in Ghana

¹Frank Nyame-Asiamah*
School of Management
Anglia Ruskin University
Cambridge, England
Frank.Nyame-Asiamah@aru.ac.uk

²Dr. Kwame Oduro Amoako
Department of Accountancy
Sunyani Technical University
Sunyani, Ghana
E-mail: Kwame.amoako@stu.edu.gh

³Professor Peter Kawalek
School of Business and Economics
Loughborough University
Loughborough, England
E-mail: p.kawalek@lboro.ac.uk

*Corresponding author

Abstract

This chapter applies cohered emergent theory to explain how multinational mining corporations operating in Africa can design and implement their sustainability practices to equalize the economic, environmental and social dimensions of sustainability. We used thematic analysis to analyze the interview data from 16 diverse stakeholders of a multinational mining company case in Ghana. The findings suggest that the company's economic, environmental and social sustainability practices were designed and implemented as a social inclusivity process that revolved around rational planning and power, critique from 'less powerful' stakeholders and emergent events, and regular adjustments to senior managers' planned actions. These design and implementation processes will help senior managers to manage business activities ethically and mitigate potential sustainability implementation risks that can damage organizational reputation, harm community welfare and destroy the environment. The study also has implications for governments and policy think tanks of developing countries to rectify corporate sustainability policies that can foster fair allocation of royalties and taxes from multinational mining companies to the mining communities and to reduce rural poverty. The outcome of the study manifests the theoretical value of the cohered emergent discipline in practice.

Keywords

Cohered emergent theory; economic sustainability; environmental sustainability; social sustainability; multinational mining; Ghana

Accepted for publication in the following book:

Science, Technology and Sustainability: Volume 1 (2022). Crowther, D. and Seift, S. (Eds.) The Complexities of Sustainability. World Scientific. <https://doi.org/10.1142/12902>

1 Introduction

Extractive companies create jobs and wealth for economic development yet their activities degrade environment, deprive the livelihoods of many people living at the mining communities and raises concern for social justice (Gerlak & Zuniga-Teran, 2020). The left-over mining materials cause severe damage to arable land, water bodies, vegetation and environment (Sun et al., 2018). Policy discourse has intimated that the present wealth creation objectives should not be pursued carelessly to compromise the future use of scarce resources (Hansmann et al., 2012) or disadvantage people whose livelihoods and wellbeing depend on equitable use of resources (Essah & Andrews, 2016; Gerlak & Zuniga-Teran, 2020). The United Nations requires companies to operate responsibly and balance their financial benefits with ecological and social expectations of their diverse stakeholders in order to achieve sustainable development goals and make our world fairer (Tsalis et al., 2020).

The former Norwegian Prime Minister, Gro Harlem Brundtland had earlier summarised such sustainable development initiative as one that “seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future” (World Commission on Environment and Development, 1987, p.7). Brundtland ratifies that sustainable development must be designed, implemented and practised equally around economic, environmental and social sustainability dimensions (Senior, 2003). Her sustainability advocacy was advanced through the Triple Bottom Line framework which uses economic, environmental and social dimensions of sustainability to explain how companies should organize their production and communication activities to provide reasonable opportunities for their primary stakeholders, preserve healthy environment and promote social justice for communities (Elkington, 1997; 2005; Norman & MacDonald, 2004).

The contention is that managing and balancing economic, environmental and social dimensions of sustainability is a complex and challenging task for both private and public

sector organisations (Fischer et al., 2020). First, the foci of these three sustainability dimensions are different and often conflicting. Economic sustainability focuses more on wealth creation and financial stability for businesses, their primary investors and internal stakeholders (Elliott, 2005). Environmental sustainability emphasizes the conservation of ecological systems, and reduction of risks of pollution and harm to natural resources (Scott, 2003) whilst social sustainability addresses concerns about injustices, social inequalities and exploitation of vulnerable groups (Adonteng-Kissi, 2017). Companies' efforts to achieve financial objectives connote clear, measurable and short-term indicators whereas social and environmental measurements are mostly ambiguous and uncertain (Epstein et al., 2015). While a company may pursue moderate social and environmental goals for public benefits, their financial goals are usually aggressive to boost competition or risky to yield higher returns (Epstein & Buhovac, 2014; Godelnik, 2021).

Some researchers see the relationship between economic, environmental and social goals is one that is characterized by short-term competition and firm-centric interests which are inconsistent with long-term public benefits (Mackey et al., 2007; Meyer & Gauthier, 2013). There is therefore an increasing need for effective sustainability implementation that can address the challenges of equalising the three dimensions (Chofreh & Goni, 2017; Shakeel et al., 2020; Ghadge et al., 2020). Research studies have continued to explore a holistic and result-oriented approach to implementing corporate sustainability practices that align with corporate vision and can promote globalization and continuous improvement (Lloret, 2016; Rabbe & Schulz, 2011).

Although the Global Reporting Initiative (2021) has offered principles and reporting frameworks to guide environmental and social sustainability practices of mining corporations, the initiative has been criticized for supplying unreliable information and its deficiency of site-level performance indicators (Fonseca *et al.*, 2013). The question is how can multinational

mining companies design and implement their sustainability practices to achieve equality between the economic, environmental and social dimensions of sustainability? Existing studies continue to encourage researchers to find ways of developing sustainability initiatives that can integrate the three dimensions equally and meet the expectations of stakeholders of mining companies including the companies themselves (Asr et al., 2019; Azapagic, 2004; Niesenbaum, 2020).

This chapter applies cohered emergent theory to explain how multinational mining corporations operating in Africa can design and implement their sustainability practices to equalize the economic, environmental and social dimensions of sustainability. Cohered emergent theory is a social inclusivity theory that prescribes how stakeholders with diverse interests can negotiate, collaborate and contribute to sustainable design and implementation initiatives (Nyame-Asiamah 2020; Nyame-Asiamah & Kawalek, 2021). We utilize the case of Precious Gold Mining Limited (pseudonym) subsidiary in Ghana and explore the narratives of the company's internal and external stakeholders based on cohered emergent theory to explain how the company implemented its economic, environmental and social sustainability initiatives.

The outcomes of the study will encourage multinational mining companies to empower local communities and other stakeholders in designing and implementing their sustainability initiatives to meet the needs of those whose interests are impacted by the companies' operations. It will also motivate environmental agencies and policymakers in developing countries to enact mining policies that can encourage ethical mining business and improve lives in mining neighbourhoods.

The rest of the chapter is organized as follows: Firstly, we discuss existing literature and frameworks for implementing sustainability practices to highlight their merits and challenges. Secondly, introduce cohered emergent theory and explain how it can help

companies to integrate their economic primacies with environmental and social values of their communities and adhere to ethics of responsible business. Thirdly, we introduce the context of Precious Gold Mining Limited in Ghana and discuss our research methods. Fourthly, we interpret the data and proceed to discuss our findings. Finally, we conclude the chapter with a summary of our contribution and implications for practice and research.

2 Sustainability implementation frameworks

Research studies have highlighted several sustainability models that explain how companies can report their environmental and socio-economic performances and their benefits for stakeholders, but there are challenges with design and implementation of these existing sustainability models (Azapagic, 2004; Morioka et al., 2017; Niesenbaum, 2020).

Firstly, the Global Reporting Initiative (GRI) framework outlines a wide range of sustainability performance indicators that help organizations to measure and disclose the impact of their activities on economy, environment and society in a way to improve the value and credibility of their reports (Diouf & Boiral, 2017; Thomas, 2019). The framework seeks to promote accountability and openness in reporting activities of ten industries which include mining and metals, electric utilities, and oil and gas (Global Reporting Initiative, 2021; Gallego-Alvarez et al., 2019; Pisani et al., 2017). The difficulty is that GRI standards are generic, they lack site-specific data and allow opportunities for companies to manipulate their reports to manifest their consciously planned sustainability outlook (Fonseca *et al.*, 2013). The implication of this is that good sustainability reporting does not necessarily mean good sustainability performance. For instance, Belkhir et al. (2017) examined carbon emissions data of 40 companies reporting on GRI and those which did not report on it, and found there was no relationship between GRI reporting and better sustainability performance. It is even far more difficult to use GRI standards to compare economic sustainability of private companies with local benefits for communities (Amoako et al., 2017; Thomas, 2019) and to access non-

financial reports and compare them evenly between different companies (Brown & Farrelly, 2009).

Secondly, International Organization for Standardization (ISO), an independent, non-governmental international organization with a membership of 165 national standards bodies has set out a series of environmental management standards (ISO 14000 series) to help organizations to reduce energy use, cut material waste and protect the environment (Gleckman & Krut, 2017; Bravi et al, 2020). The key objectives of ISO 14000 include minimizing business impact on air, water, and land, and ensuring that companies comply with environmental policies, laws and regulations (Testa et al., 2014; Mazzi et al., 2020). A survey of 1,508 Italian ISO 14001 certified companies which implemented ISO standards confirm that the companies considered the standards useful for reducing energy and waste as well as preventing and monitoring environmental risk (Bravi et al., 2020). Notwithstanding the benefits, another study involving a survey of 361 ISO 14001 certified corporations in Spain found that the cost of implementing the standards and maintaining the certification was expensive (Heras-Saizarbitoria et al., 2016). Another criticism is that ISO 14000 series are exclusive to environmental protection and do not focus on social dimension of sustainability such as operational health and safety issues (Curkovic & Sroufe, 2011). Others contend that companies may even need time to adjust to revised versions of ISO 14000 before they can achieve the expected outcomes of the standards (Boiral & Henri, 2012; Vilchez, 2017). This justifies the need for flexible budgeting and standards in corporate project management (Bartley et al., 2017; Patel, 2007; Roth, 2008).

Thirdly, the Carbon Disclosure Project which was initiated in early 2000 as an international non-profit organization encourages cities and the 500 largest global companies to disclose their greenhouse gas emission data, supply chain activities and other climate change related information, and to take proactive actions to make their activities carbon neutral

(Siddique et al., 2021). The limitation is that environmental disclosures do not necessarily lead to improved market value (Matsumura et al., 2014; Hassan & Kouhy, 2014) and some companies even fail to divulge their carbon emissions (Stanny, 2013). Matsumura et al. (2014) collected emissions data on Standard & Poor's firms through a Carbon Disclosure Project questionnaire and found that companies' carbon emissions were significantly negatively related to their market value. Hassan and Kouhy (2014) also examined the relationship between environmental disclosure and performance of oil and gas industry in Nigeria by analyzing annual reports, press releases and fact sheets of the studied firms' activities. They found that the firms' disclosure content related negatively with their carbon emission performance. Some studies argue that the Carbon Disclosure Project is a market and risk predicting tool that encourages firms to use disclosed information to create more real financial incentives for investors through stock price appreciation than to highlight sustainability benefits for employees and local communities (Alsaifi et al., 2020; Nizam, 2019).

Fourth is the Triple Bottom Line theory which explains how an integration among economic, environmental and social dimensions of sustainability can be used to measure the total impact of a companies' actions around profit, planet and people (Senyo & Osabutey, 2021; Shim et al., 2021; Zaharia & Zaharia, 2021). By employing the Triple Bottom Line framework, Shim et al. (2021) examined the relationship between corporate social responsibility dimensions and the market value of restaurants by using data from 32 publicly traded restaurants in the US between 1999 and 2012. They reported that the economic responsibility activities increased the value of the restaurants through their community services and improved consumer products whereas the environmental responsibility activities reduced the market value of the restaurants. In another study, Tjahjadi et al. (2021) adopted the Triple Bottom Line framework to examine the impact of corporate sustainability programs on good corporate governance which included education of board of commissioners of non-financial firms listed

on the Indonesian Stock Market between 2013 and 2017. They found that education of the board of commissioners had negative effects on the companies' economic and environmental sustainability and no effect on social sustainability although the size of the board correlated positively with economic sustainability performance. The outcome did not match the theoretical hopes of Triple Bottom Line, and it is supported by the critique that in spite of the benefits of Triple Bottom Line, it does not fully capture social and emotional expectations of many stakeholders which are often unpredictable (Boje, 2016). As researchers continue explore holistic sustainability frameworks to integrate and equalize the economic, environmental and social sustainability of company behavior (Elkington, 1997; 2013; Roberts & Cohen, 2002) and encourage complexity-based models for addressing sustainability challenges (Brown, 2008; Cohen, 2001; Korten 2005; Kuhmonen, 2017), we apply cohered emergent theory to explore fresh insights to corporate sustainability design and implementation.

3 Cohered emergent theory

Designing sustainability practices to equalize the economic, environmental and social domains of sustainability and to meet diverse expectations of multiple stakeholders of mining companies is not a straightforward activity for corporate managers. It is a complex process that involves power plays, compromises, moral judgements and regular interactions between stakeholders who are affected by the sustainability agenda. This goes beyond the consideration for balancing the three domains of sustainability to include emergent actuality, a system design process which uses power negotiation, knowledge sharing and understanding of unexpected occurrences to address sustainability expectations of stakeholders (Nyame-Asiamah & Kawalek, 2021).

It is based on the idea that the processes of designing and implementing corporate responsibility practices must draw on emergent and adaptive system approaches to allow

managers to utilize their decision-making powers sensitively to address the concerns of people whose lives are affected by business activities (Brown 2008; Cohen 2001; Bastola & Nyame-Asiamah, 2016; Schianetz & Kavanagh, 2008). These propositions are firmly nested in Cohered Emergent Theory, a social inclusivity model that prescribes how stakeholders with diverse interests can negotiate, collaborate and contribute to sustainable design and implementation initiatives (Nyame-Asiamah 2020; Nyame-Asiamah & Kawalek, 2021). The theory uses learning and self-organizing behaviors to explain how complex and continuous interactions between multiple stakeholders can facilitate a collaborative shift of power between corporate managers and other stakeholders, to address conflict of interests and centralized controls within sustainable design initiatives.

Cohered Emergent Theory draws on the complexity view that a system has several independent agents who interrelate spontaneously and continuously within their environment to create unified patterns and coherent outcomes (Nyame-Asiamah, 2013). The agents adapt to actions and reactions that emerge from their continuous interactions, which is not controlled centrally by a single individual or a group of agents (Kuhmonen, 2017; Schianetz & Kavanagh, 2008). The multiple and adaptive interactions by agents are complex and nonlinear yet they follow simple rules to generate greater outcomes than the sum of individual of agent's contributions to the system. Cohered Emergent Theory therefore follows the principles of complexity, sets out four interrelated modules to govern its operationalization and explains how managers can design sustainability practices to address emergent actuality of diverse stakeholders' concerns. One is the CAS (complex adaptive system) domain that describes the self-organizing space for diverse stakeholders to interact and co-create sustainable innovations, and three are learning and decision outcomes that emerge from stakeholders' multiple and complex interactions (Nyame-Asiamah & Patel, 2010; Nyame-Asiamah 2020; Nyame-Asiamah & Kawalek, 2021). These are illustrated in Fig. 1 to highlight the conceptual

application of the theory to corporate sustainability and consumer behaviour fields as a cohered corporate sustainability model.

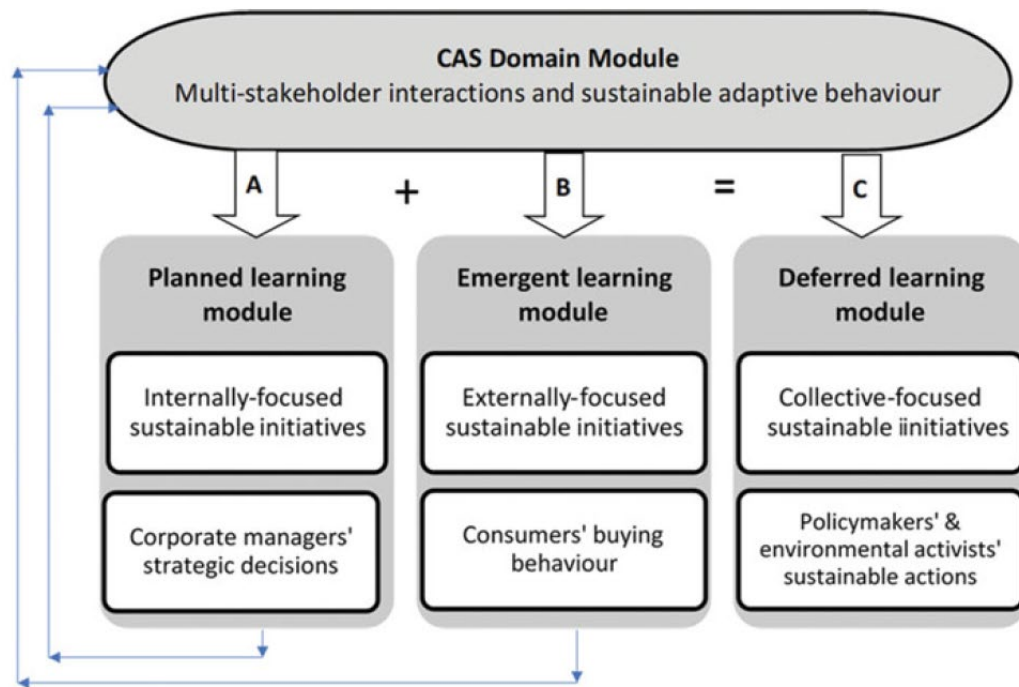


Fig. 1: Cohered corporate sustainability model derived from on cohered emergent theory (copied from Nyame-Asiamah & Kawalek, 2021)

The CAS module represents an evolutionary system that can allow corporate managers, employees, investors, community members and other stakeholders such as regulators, environmental activists, non-governmental organisations, political actors and the United Nations to interact, design and implement sustainability practices to benefit the interests of multi-stakeholders and their environment (Nyame-Asiamah & Kawalek, 2021). The CAS module removes managerial power exertions from collective discussions that aim to achieve healthy ecology, effective production and inclusive society. As demonstrated by Fig 1, the outcomes of the stakeholders' interactions emerge through the planned learning module (A), the emergent learning module (B) or the deferred learning module (C) to typify the usual sustainable development actions of corporate managers/executives, the communities and

employees (consuming public) and the other groups such as regulators, policymakers/environmentalists.

The planned learning module explains the rational planning decisions of corporate managers which prioritize internally focused sustainability practices to make their companies more competitive in the market and maximize the rewards of their investors. Planned learning uses strategic-driven measures to design and implement sustainable development activities. It emphasizes more on economic sustainability than ecological preservation, social inclusion, and emotional needs of communities and non-managerial staff of companies which often emerge unpredictably.

The emergent learning module encourages moral, communal and emotional expectations that are essentials for environmental and social sustainability practices. It is an externally focused process which stimulates collaboration and negotiations between corporate managers and ‘less powerful’ stakeholders such as ordinary community members and non-managerial staff who have minimal influence on corporate responsibility decisions. Emergent learning is an innovative process of learning because it empowers ‘less powerful’ stakeholders to engage effectively in sustainable development initiatives. It creates a democratic space to critique weaknesses with existing sustainability initiatives and provide feedback for improving environmental and social sustainability practices. By responding to the emergent knowledge of the ‘less powerful’ stakeholders, corporate managers will modify, postpone or defer their rational plans for sustainability in an attempt to equalize the three dimensions of sustainable initiatives.

The deferred learning module describes a learning and decision-making process that motivates corporate managers to use suggestions by the ‘less powerful’ stakeholders, regulators, policymakers, environmentalists and other interest groups to modify and improve their sustainability practices. It draws insights from deferred model of reality, a theoretical

construct that explains how software designers can design information systems flexibly to encourage users to shape the design processes in emergent conditions (Nyame-Asiamah 2013; Patel, 2006; Ramrattan & Patel, 2010). The deferred learning module also creates the opportunity for policymakers and environmental activists to negotiate sustainability initiatives directly with big corporations and encourage them to implement sustainability practices that can promote healthy environment (Nyame-Asiamah & Kawalek, 2021).

The cohered emergent theory is a nascent theory that has been tested, utilized and welcomed in many situations to address power issues, conflicting stakeholder interests and system design tensions in different contexts. The theory was employed as a thematic analysis model to analyze comprehensive data from eight Higher Education institutions in Nepal that aimed to improve their curriculum provisions and student experience (Bastola, 2019). Its practical merits were acknowledged through extensive qualitative research in Komfo Anokye Teaching Hospital in Ghana where 20 recommendations were made to narrow the manager-clinician tension in (re)designing healthcare knowledge based (Nyame-Asiamah, 2013, p.334-335). The cohered emergent theory was applied to study how healthcare managers and clinicians adopted video consultations in the Alliance (University Hospitals of Leicester) in the UK, with informed change recommendations to increase the utilization of video consultations in the hospital (Gilbey, 2021).

The capability of the theory has also been recognized in the Information Technology for Development editorial report as research that can underpin effective healthcare ICTs implementation and improve health outcomes in areas with socio-economic inequality during pandemic emergencies (Qureshi, 2020). There are also ongoing research projects applying the theory to explain how to: (i) implement enterprise policy and programs effectively for small and medium enterprises Nigeria; and (ii) evaluate and design employee reward and motivational packages in Nigerian commercial banks (DMU, 2021). We further examine the

theoretical merits of cohered emergent theory by utilizing our multinational mining case study to explore empirical data on the theory and explain how multinational mining corporations operating in Africa can design and implement their sustainability practices effectively. This will unveil the theoretical advancement of cohered emergent theory to understand how to companies can equalize the economic, environmental and social dimensions of sustainability in practice.

4 Methodology

4.1 Research context of Ghana and Precious Gold Mining Limited

This study was conducted in Precious Gold Mining Ltd, a subsidiary company of a South African multinational mining corporation operating in Ghana. Ghana itself is the biggest gold producing country in Africa (Ghana Chamber of Mines, 2021). The recent number of companies exploring gold, bauxite, diamonds and manganese undertakings in Ghana is about 90, over 300 registered small scale miners and 90 mine support service companies (Essah & Andrew, 2016). Gold mining industry has contributed generated gold export income to Ghana since the 1980s (Tuokuu et al., 2018). The Minerals Commission estimates that 3% of gross sales of gold is paid to the government as royalties. Of this, 80% goes to the consolidated fund of the Ghanaian government, 10% is distributed to mining administrative departments and the remaining 10% allocated to local communities (Aryee, 2001; Tuokuu et al., 2018). The sector is one of the highest paying industry jobs in Ghana although there are inequalities in employees' remuneration (Ankrah et al., 2017).

Despite of the socio-economic contribution of mining, the sector has been heavily criticized for polluting the environment, contaminating water bodies, disfiguring landscape and disturbing the social structures (Idemudia et al., 2020). Mining activities have displaced many communities and reclaimed farmlands from local residents who cultivate the lands as a source

of livelihoods (Essah & Andrews, 2016). To address these challenges, the Minerals and Mining Law of 1986 was implemented to reconcile the possible conflicts between economic development and natural resource management (Akabzaa & Darimani, 2001; Tuokuu et al., 2018). Unfortunately, this law failed to balance economic benefits of minerals with effective management of natural resources as it allowed the multinational mining companies to repatriate more profits from mining activities to their countries of origin. Subsequently, the national environmental policy was adopted to mandate the Environmental Protection Agency of Ghana in protecting the environment and promoting sustainable use of economic resources (Environmental Protection Agency, 1995). Environmental Protection Agency Act (Act 490) agency has the mandate to conduct environmental impact assessments, punish those who contravene environmental regulations, and granting environmental permits to mining companies (Tuokoo et al., 2018). The Ministry of Lands and Natural Resources also established the Ghana Minerals Commission under Article 269 of the Constitution of 1992 and the Minerals Commission Act to contribute to the formulation, implementation and monitoring of the national mining policies and regulations (The Minerals Commission of Ghana, 2021). The Minerals and Mining Act 2006 also empowers to the Commission to investigate, assess and approve prospective mining exploration. The Act has facilitated an increased foreign presence in Ghana's large-scale mining sector and a subsequent increase in mineral production. Unfortunately, research suggests that policy efforts to address environmental problems in Ghana's mining sector have not been effective and there are several cases of illegal mining activities in the country (Hilson, 2004; Tuokuu et al., 2018; Kpienbaareh et al., 2021).

Precious Gold Mining Limited has three mining subsidiaries. These are 'A' Gold Mine, 'B' Gold Mine and 'C' Gold Mine. The company is located in the southern part of Western Region of Ghana. It is about 300 kilometres by road from the west of Accra, Ghana's capital. The study was conducted at 'C' Gold Mine of Precious Gold Mining

Limited, one of Ghana's largest gold mines. We chose 'C' Gold Mine because its long-standing record of sustainability in Ghana (Teschner, 2013), its global leading position in corporate best practices throughout its history and its repeated commitment to sustainable mining practices (*Precious Gold Mining Limited*, 2021). 'C' Gold Mine is dedicated to environmental protection and community development programs such as entrepreneurship training, educational scholarships, and infrastructure building (Sadik, 2013).

Precious Gold Mining Limited employs about 6,500 people. The mining company has contributed USD 13 million towards community development and procured USD 394 million of its logistics locally. Furthermore, the company pays taxes and royalties of US\$109 million to Ghana government (*Precious Gold Mining Limited*, 2021). In 2005, the company's Foundation launched the Sustainable Community Empowerment and Economic Development (SEED) program, a five-year community development program worth US\$5 million to improve the livelihoods and quality of life of 30,000 poor and vulnerable men and women, and to support children in 16 Precious Gold Mining Limited primary stakeholder communities by 2010 (*Precious Gold Mining Limited*, 2005). Recent research indicates that the company has constructed schools, clinics, public libraries and roads for communities in the catchment areas of its operations (Ansu-Mensah et al, 2021; Amoako, et al., 2018). In 2020, the news media reported that the company's foundation has GH¢ 8.79 million (approximately US\$ 1.47 million) to the agricultural sector within its mining host communities (Ghana News Agency, 2020). To understand the nuances of the reported contribution, we sought the stakeholders' views to explore how the company's economic sustainability and benefits compare with the environmental and social aspects of sustainability which are externally focused.

4.2 *Data collection*

We utilized the pragmatist tradition and case study strategy to explain how cohered emergent theory informs multinational mining corporations operating in Africa to design and implement their sustainability practices to equalize the economic, environmental and social dimensions of sustainability. Pragmatism is a ‘problem centred’, ‘pluralistic’ and ‘practice-oriented’ methodology that tests theoretical constructs on empirics through a rigorous research design which captures economic, social, political and historical context of the problem being studied (Creswell, 2014; Kaushik & Walsh, 2019). A case study is an outward looking research strategy which is used to examine research problem in a real-life context where the boundaries between the research phenomenon and context are not quite clear (Yin, 2014). It allows researchers to use rich data to understand nuances of a single environment and advance theories in qualitative research (Crane & Glozer, 2016; Eisenhardt, 1989).

We used purposive and snowballing sampling techniques to invite the participants to take part in the study after obtaining their consent. Seven internal and nine external stakeholders of the company provided responses to our semi-structure interview questions which covered: the nature of the company sustainability practices; the design and implementation processes of the sustainability; the challenges with sustainability design and implementation processes; and how to improve sustainability practices to meet diverse stakeholders’ expectations. The internal stakeholders constituted the managers and employees of the company whilst the external stakeholders were selected community residents, the Ghana Environmental Protection Agency and the Ghana Police Service. These external stakeholders emanated from the catchment communities of the company’s mining sites which include Subri, Damang, Huni-Valley and Koduakrom and they had lived experience of the company’s sustainability practices as well as the impact of mining on local people and the environment.

The profile of the participants and the duration of the tape-recorded interviews are summarized in Table 1.

Table 1: Research participants' affiliations, positions and interview duration

Participants affiliation	No. of participants	Position and codes	Average interview duration
Precious Gold Mining Ltd	4	Senior Managers (Senior Manager A, B, C, D)	54 minutes
Precious Gold Mining Ltd	3	Junior Managers (Junior Manager A, B, C)	45 minutes
Mining communities	5	Community residents (Community resident A, B, C, D, E)	60 minutes
Environmental Protection Agency (EPA), Ghana	2	Regulators (Regulator A, B)	75 minutes
Ghana Police Service	2	Police officers (Police officer A, B)	43 minutes

4.3 Method of analysis

We transcribed the interview transcripts and applied thematic analysis (Braun & Clarke, 2006; Eisenhardt, 1989) to identify common themes and patterns from the participants' responses that related to the individual participant groups' views and experiences of designing and implementing sustainability practices to reflect their varied interests. We carried out several iterative processes to find variations between the managers' rationale for initiating and approving sustainability activities and other stakeholders' expectations for ecological quality and social value, and how these affected the balance between economic, environmental and social sustainability (*see* Yin, 2014). During these iterative processes, we inductively selected statements/phrases that pointed to our research question and offered new insight to our

understanding of how the company attempted to equalize the three sustainability dimensions. We then grouped statements/phrases of similar characteristics into the following four categories which manifest the core modules of cohered emergent theory: Thinking sustainability as collective agenda; budget, power and economic sustainability; unexpected issues affecting sustainability design; and changing cause to equalize the three dimensions of sustainability. We interpreted the findings around these core categories of thematic analysis and further discussed how fresh data is explored on cohered emergent theory to understand the meaningful way multinational mining companies can design and implement their sustainability practices to equalize the economic, environmental and social dimensions of sustainability.

5 Findings and Interpretation

5.1 Thinking sustainability as collective agenda

The data suggests that the mining company operated within a complex system which involved many stakeholders with different and sometimes conflicting sustainability goals which include financial costs and benefits of implementing sustainability initiatives, protection of environment, development of community infrastructure and promotion of social wellbeing. Balancing and achieving these conflicting goals was a challenge for the diverse stakeholders whose expectations, interactions and decision-making were often marred by power, control and self-centredness.

Some managers accused the accounting and financial management team of the company for disapproving and delaying their requests for environmental and social sustainability initiatives. Senior Manager C stated his frustration as follows:

Accounting guys are troublesome as they dictate our expenditure. Once they say there is no money, it's very difficult to convince them. They control our spending which is good but their work is at the same time a challenge to us. They should understand that it's not only production related expenditure that must be approved.

This argument for allocating and approving funds for sustainability projects was contrasted by a counter-claim that the company's investments in sustainability had not brought direct economic returns. Junior Manager C opined:

We don't see gold coming from environmental management; what your money is doing is not bringing gold. Just imagine, I want to extract water and the processing fee alone is \$3000. But you don't have a choice; you have to do it because you cannot use water illegally.

A critical analysis of the quote tells us that the company's sustainability might have been driven by regulatory requirements rather than a moral judgement. One junior level manager working at the Environmental Unit held the view that sustainability is not only about money allocating funds and claiming money or cost minimization but it has more to do with reducing consumption. He clarified:

Sustainable development is not solely about the money. If I reduce my quantity, the cost will go down, so that's the whole idea...if in capturing data for GRI, I don't capture the usage, that's the cost without the quantity, the data is incomplete. (Junior Manager B)

The manager's view suggests that economic sustainability can be compensated for environmental and social sustainability through effective management, sustainable production and green consumption.

Senior Manager D extended the discussion around sustainability understanding to developing better relationship between the company and the mining communities, and ensuring that ethics of sustainability is practised by the company, the community and all other stakeholders. He believed that the community itself did not practice sustainable life.

The communities don't understand yet the importance of sustainability. They think the mine, once it's here, we must take care of them and everything. When you tell them that they will suffer when the mine is shut down, they say how do you know what will happen when you leave? How we will survive is none of your business. So, it's giving us a lot of headaches trying to explain to them (Senior Manager D).

Whilst the company staff considered community engagement and collective decisions as better way to implement and practise sustainability, some community members felt the company they were not adequately involved in decisions about sustainable projects for the

community apart from holding the quarterly stakeholder meetings with the community leaders.

One resident announced his disappointment:

As for good community relations with the mine, it is somehow bad. They hardly interact with the community members directly, unless something pops up, then through their community affairs office they may convey such information. Rather, most often it is some NGOs around that organise some forums (Community resident B).

This quotation explains the need to engage the community actively to understand their sustainability expectations in order to implement projects that address their social, environmental and economic needs. The data suggests that better interactions between the company and the community were critical for effective designing social and corporate sustainability initiatives for the mining residents and their communities. Regulator A from the Environmental Protection Agency feared that the community members were not fully aware of the consequences of the mine wastes and they needed to understand the reasons for providing environmental and social sustainability projects. His concern was corroborated by Regulator B as follows:

Many community members are not well informed about the dangers of staying close to the mine waste. We advise them to stay away from the waste but they don't care the safety and health issues.

A further discussion around community safety and social sustainability initiatives revealed that sustainable projects could be implemented effectively if the community leaders would use their social positions to support sustainable mining policies that can improve socio-economic and environmental development of the community. Police Officer B said that both traditional and political leaders interfered with law enforcement activities that aimed to control illegal mining and community protection whilst Police Officer A confirmed this as follows:

This is a small town and almost everyone knows each other. The leaders in this area are fond of pleading on behalf of these illegal miners whenever they have issues with the police. This makes it very difficult to prosecute offenders because our system is such that we need the support of these leaders to make our work easier. (Police Officer A)

Our analysis of data suggests that the company's sustainability practices were complex and required the understanding of power positions, conflict of interests and how to plan rationally to address uncertainties and emergence.

5.2 *Budget, power and economic sustainability*

The planning and implementation of the company's sustainability initiatives were heavily shaped by budget which tilted towards the economic dimension. Senior Manager B who was responsible for finance and budget argued that the concept of sustainability as centred on 'money' and it is a manager's job to find alternative ways of minimizing costs. He said that:

Everything boils down to money irrespective of how fancy the idea of sustainability looks like. If you look at the environment and the community guys, they will think this is the only approach but when it comes to the finance we do cost benefit analysis of other alternatives to achieve the same purpose.

While money a predictable factor for sustainable development plans and favours economic sustainability, the interpretation from the above quotation is that managers have alternative paths towards budgetary allocations and their plans should not be always static. In addition, the Junior Manager A explained that they followed strict and expensive ISO guidelines to deliver provide safe mining activities.

The ISO 14001 is the engine of our environment department system and it is very expensive to keep the system. If the system tells to you employ five officers you have to, else your certificate will not be renewed on expiry. (Junior Manager A).

It also noted that the power positions of the local chiefs and assemblymen (local government representatives) were often used to gain some contracts from the mining company and these were expected to bring some social benefits to the community but this was not the case. Community resident E reported his concerns:

What I know is sometimes they allocate some kind of royalties to chiefs in the town and they also award some kind of contract to the assemblyman. With these kinds of offers to these leaders, it is expected that they can also contribute something to the community. (Community resident E)

Some residents considered the behaviour of chiefs and community leaders in the sustainability implementation processes as self-centred. Community resident D added that his frustration to this rationalist view of managing resources to suit people with authority:

Chiefs and leaders bring people from different places and take money from them in exchange for community members' employment opportunities with the company.

Community resident C also criticized the chiefs' influence on the company's sustainability agenda which did not benefit the ordinary members of the community and looked up to God.

We, the residents here, need help but some of the chiefs behave selfishly. They rather side with the mining officials, with some of them getting contracts from the mining firm. Over here it's only God who can help us.

The expression "only God can help us" signifies the helpless situation of the community members who felt that they did not benefit from the company's lucrative remuneration which was far better than many white color jobs regardless of the staff's academic qualifications. This gave reasons for the chiefs and community leaders to act as middlemen and connected job seekers who did not necessary lived in the community to mining jobs which according to Senior Manager A offered the lowest-paid worker a basic monthly salary of US\$500 excluding allowances, 30% overtime of the basic salary and six months generous bonus. Community resident B corroborated the manager's claim:

Compared to other cities like Kumasi and Accra [two largest cities in Ghana] you can't get access to a good paying job unless you have a high certificate. But here with some little training at junior high school, one earns a good salary. The money a junior high school graduate is earning by working with the mine, even if you have your MBA or lecture at a university, you can't get that money.

The deeper interpretation of this quotation is that the company attached more importance to the financial welfare of their staff which echoes the assertion that economic welfare subjugates the need for environmental and social sustainability (Böhling et al., 2019; Garvin et al., 2009).

5.3 *Unexpected issues affecting sustainability design*

Aside from the (estimated) cost involved in developing and implementing sustainability projects for the community, we identified some emergent factors such as acid rock drainage (ARD), encroaching behaviour and other uncertainties influenced or changed the rational sustainability design. Senior Manager B explained that acid rock drainage can often leak into the stored mined rocks to increase the estimated costs for chemical treatment. He elaborated:

On the side of environment, we are dealing with material in higher ARD [acid rock drainage]. Sometimes you mine the material and you store them in the storage pits and, before you could say Jack Robinson [say someone's name], acid is coming out of it into the environment and that needs to be treated which costs very high. (Senior Manager B)

Junior Manager A gave account of how the company abandoned a bio-gas project because of their inability to obtain expert advice on bio-gas, a problem which was not anticipated at the planning stage. Instead, the company used financial limitation as cover story to explain why this environmental project did not go ahead. He said:

Some time ago we wanted to do bio-gas, instead of land fill waste but it was so difficult to get somebody who is not versed in environmental issues to understand. Rather, emphasis was placed on the financial situation of the company and the project was not approved. When your hands are tied like that, you only do what is critical. You don't get room to do what might not be critical but necessary. (Junior Manager A)

Our interactions with the company staff revealed that some intruders and local hunters entered the rehabilitated areas and used fire to drive rodents out from their holes which often ignited dry plants and cause bush fires. Junior Manager C cautiously narrated one incident when some acres of reclaimed land caught fire through such intruding behaviour and it unexpectedly increased the company's environmental sustainability costs:

Here is the case where the community encroaches on rehabilitated land... whether those people were hunting or... the place is burnt and about ten to fifteen acres is gone. These are areas we have spent money to rehabilitate the land so when EPA confirms it has matured, it reduces the bond we have to pay to the Ghana Government. All of a sudden it becomes an extra cost for us.

The implication of these unexpected occurrences is that the company would find it difficult to secure funds for projects that fell outside of their budget. Junior Manager A summarised such challenges as follows:

Sometimes unexpected issues may come up that need attention. For example, you planned to work only at site A this year and then in the course of the year something comes up and it becomes necessary to go to site B. There is no budget allocation for the environmental impact assessment that needs to be done there and that is a problem.

Probing the activities of the intruders further, the research participants from the company indicated that some of the trespassers surprisingly stole vegetables and food crops which had to be tested for human consumption from the company's simulation farms. They were frustrated by such unexpected actions of the intruders that could reduce the quality of environmental data needed to verify the safety of produce harvested from the reclaimed lands. Although the community members agreed that people trespassed the mining site, they believed that some intruders were not community residents. One of them argued as follows:

Yes, I agree that there are times that some people do trespass on the property of the mining company. However, this place is a mining area and it attracts a whole lot of people from Ghana and even outside Ghana. I don't think it's always that encroachers do come from our communities. (Community resident A)

The critical interpretation of the data is that the company's planned actions can be distorted by encroachers and their activities regardless where they come from.

Our conversation with the participants also revealed that the cost of maintaining some facilities provided by the company was a tussle between the company and the community. Senior manager D argued that the company needed to implement more water projects for communities which did not have potable water than focusing on repairs for communities which were already benefiting from facilities. He articulated:

There are communities that have not received any water project and are also expecting us to provide them with water. So, if those communities enjoying the water want us to come and repair it when it is broken down then it's a quite difficult situation (Senior Manager D).

While the manager's argument seems logical, some residents criticized the company's expectation that the community should pay for water maintenance which residents could not afford. Community resident E said:

We were enjoying free water from nature and if mining activities have polluted such sources of water, it is their obligation to provide another alternative for free. Hence the company has no option than to repair them when broken down.

The sense-making of the resident's critique is that it is the company's social responsibility to restore any damaged natural resources in the community that emerge as a consequence of their mining operations.

5.4 Changing cause to equalize the three dimensions of sustainability

As the interview progressed we noted that the managers understood the insatiable needs of the community, used flexible budget to address some unexpected costs of sustainability, met quarterly to discuss sustainability matters, and responded to the community youth protest and critical comments by changing their recruitment practices.

While the funding formula for social and environmental sustainability projects was based on a USD 1 per ounce of gold produced, plus 1% of profit for the community, the participants explained that the falling production levels and gold prices were an obstacle to the company's sustainable development projects. Such uncertainties put pressure on the company and required application of flexible budget. Senior Manager D described his experienced and challenges:

The need of communities around the mine is insatiable and that is where I face challenges in resource allocation. The pressure from the communities are just too much.

To meet the community's sustainability expectations, the company applied flexible budget which allowed to make adjustment to planned spending and switched money between alternative projects. Junior Manager A explained how he might manage contingencies as follows:

If I have the budget for A and B, when it comes to using that budget and I need more for A, I should have that flexibility to go and take funds from B and add it to A, as long as what will be left for B will be enough.

Managers with costing and budgeting responsibilities shared opinion on how other managers could handle unplanned social responsibility expenditure:

We understand that there could be unexpected cost, so we tell them to inform us on such issues so that we discuss the way forward (Senior Manager B).

Our conversation with the residents showed that the company met the community members every quarter to discuss the needs and concerns of the residents and what they (the company) were doing to support the community. However, the residents wanted their requests to be addressed more than the company reporting their plans and performance to the community:

We meet quarterly and they set the agenda for the meeting and most often they give a report on the performance of the company. We will be happy if we can make an input into projects that they should do for us before executing such projects, instead of them just determining projects that they should do for us whilst our immediate need lies unattended (Community resident A).

The interpretation of the data is that the company the residents wanted a shift from designing the social and environmental sustainability rationally towards a more inclusive approach that could address the community needs. Although they the community residents were displeased about the previous recruitment process of the company which denied many community job seekers the opportunity to be recruited into operational management roles. Community resident C narrated that the youth protested against the practice:

They will bring their own people and that made the youth rise against them, leading to the change in trend. We think that, if nothing at all, the menial jobs should be given to the nearby villagers and this has changed the trend a bit (Community resident C).

The meaning of the ‘changed trend’ denotes how the company had used the critique and negative feedback to improve their social sustainability practice although they felt that more could still be done. Community resident A summarized this as follows:

The employment situation was worse until about seven years ago when the youth here demonstrated violently against the management of the mining company. After that the mining firm started recruiting but even still I think it's not enough.

One manager confirmed that the recruitment process has improved to offer more opportunities for the community members:

The percentage of our employees and contractors from the catchment areas is 56% as at the last quarter. What we do is to make sure that most of the recruitment that we do comes from the communities. It is only scarce skills that we don't get from the communities (Senior Manager A)

6 Discussion

This chapter applied cohered emergent theory to explain how multinational mining corporations operating in Africa can design and implement their sustainability practices to equalize the economic, environmental and social dimensions of sustainability. Our findings suggest that the company perceived sustainability design and implementation as a collective process which involves decisions and participation of many stakeholders with conflicting interests. The design process was planned and initiated by managers and people in positions of power whose actions were often influenced by resource availability and economic priorities. The managers' conscious actions were affected by the changing socio-economic needs of the community residents, their critical feedback and unexpected occurrences. Managers responded to the residents' feedback and unpredicted events by modifying their (managers') sustainability plans, pausing the planned implementation process or redirecting their scarce resources as they attempted to equalize economic, environmental and social aspects of sustainability. The participants' narratives exemplify the features of complex adaptive behavior, planned learning, emergent learning and deferred learning when explored through cohered emergent theory to explain corporate sustainability implementation (Nyame-Asiamah, 2013; Nyame-Asiamah & Kawalek, 2021).

Firstly, the findings suggest that extractive companies prioritize economic sustainability for many reasons. They aim to secure greater returns on investment, pay their staff adequately and use economic models like cost-benefit analysis to minimize their operational costs or maximize revenue. These revealing objectives strengthen senior managers' and cost accountants' roles in setting financial targets and persuading others to follow in organizations. Operating within many regulatory frameworks, managers of multinational mining rationalize their spending to reflect the demands of environmental standards. Improvising from the junior manager's narrative, Precious Mining Gold Limited had to comply with the expensive ISO 14001 standards including the obligation to employ minimum number of technical staff before satisfying environmental (re)certification requirements.

In this unique case, the managers' aim to prioritize economic sustainability overlaps some environmental sustainability targets. They use their decision-making powers to orchestrate sustainability activities. Their decision-making behaviors lean towards sustainability practices that can make their company more competitive. The managers' actions manifest the planned learning path of cohered emergent theory (Nyame-Asiamah, 2020; Nyame-Asiamah & Kawalek, 2021). Quite surprising, the community leaders and chiefs who collaborated with the managers to implement sustainability activities were repeatedly alleged to have utilized their positions of power to induce the social responsibility initiatives such as the community recruitment quote for their own interest. Despite of its strategic benefits, planned learning is exclusively not sufficient to discharge sustainability initiatives to meet the expectations of diverse stakeholders. This regurgitates the view that planned actions must respond to emergence to achieve sustainable development initiatives (Nyame-Asiamah, 2020; Nyame-Asiamah & Patel, 2010; Patel, 2006; Ramrattan & Patel, 2010).

The findings from this study reveal many characters of emergence that were different from rational sustainability design. For instance, the community residents reminded the

company to take the responsibility for repairing water projects and bringing back the *natural* state of water that had tampered by the mining activities in the community. This knowledge of business ethics was more incidental to the company's plans to develop new water projects than maintaining the existing ones, but essentially needed to improve social sustainability expectations of the community.

There were similar emotionally charged actions by the residents that encouraged the company to recruit more mining workers from the community and helped them to improve their social responsibility activities for the locals. The risk of acid rock drainage which increased operational costs and encroachers' actions which distorted the simulation farm data or caused bush fires to the prohibited land were also unpredictable events that emerged through the company's interactions with its physical or social environment. The warning signs of these negative events prompted the company to think about flexible budgeting and management approaches, which does not base on strict standardized activities or inputs (Patel, 2007; Singh et al., 2009). Flexible budgets create buffers for companies to manage financial uncertainties and apply alternative modes of executing sustainability initiatives effectively (Bartley et al., 2017; Roth, 2008). These are unknown elements of rational sustainability planning which emerge through human interactions with their environment, learning and adaptation. It signals features of emergent learning that empowers 'less powerful' stakeholders to negotiate with senior managers and address lapses in rational sustainability design.

The interaction effect of negotiating sustainability decisions between 'less powerful' stakeholders and senior managers is revealed through our case study where the company increased their recruitment quota for the community residents as a response to the residents' protest and critique. This was a better social sustainability outcome achieved through collaborative shift of power from corporate executives to the 'less powerful' stakeholders of the community. By changing their recruitment plans to accommodate the social responsibility

expectations of the residents, the managers' actions reflect deferred learning (Nyame-Asiamah & Kawalek, 2021; Patel, 2006). The company discussed the sustainability issues with the community on a quarterly basis to understand the local stakeholders' expectations and environmental concerns, and attempted to address these matters collectively. Although the company emphasized more economic dimension of sustainability due to the apparent financial constraints, they committed a lot of resources to delivering environmental and social sustainability activities to meet most expectations of their community residents. They adopted a pragmatic approach to designing and implementing sustainability practices to equalize the economic, environmental and social dimensions of sustainability. Their sustainability implementation efforts were characterised by continuous interactions between the company and its stakeholders that fostered negotiations, power shift and adaption to exemplify the discipline of cohered emergent theory.

7 Conclusion

7.1 Contribution and implications

We applied cohered emergent theory (Nyame-Asiamah, 2020; Nyame-Asiamah & Kawalek, 2021) to explain how multinational mining corporations operating in Africa can design and implement their sustainability practices to equalize the economic, environmental and social dimensions of sustainability. The application of the cohered emergent discipline is our contribution to theory and practice. By utilizing the case of Precious Gold Mining Limited and empirical data from the company's stakeholders, we have contributed fresh insights to the literature on corporate sustainability implementation that encourages participation, inclusion and empowerment of 'less powerful' stakeholders in corporate sustainability decisions. It adds to the body of knowledge that explains corporate responsibility and sustainability practices from emergent and adaptive perspectives (Brown, 2008; Cohen, 2001; Korten 2005) and

emphasize the value of cohered emergent theory in a different sector and within a pragmatist philosophy. The theory enhances our understanding of how to address power issues, conflict of interest and emergent actuality in sustainable design agenda (Nyame-Asiamah, 2020).

The application of cohered emergent theory will motivate sustainable development advocates to design and implement sustainability projects as a collective initiative that aligns with the CAS module and its interrelated planning, emergent and deferred learning processes now and the future. This contribution will make the implementation of existing rational sustainability standards and reporting frameworks more meaningful to local contexts where emergence and changing community expectations can be adequately accommodated in corporate responsibility and sustainability practices (Patel, 2007; Polacek et al., 2012; Schianetz & Kavanagh, 2008). By validating the merits of cohered emergent theory through a pragmatist philosophy and a case study strategy, we also contribute rich empirical case to support teaching in academia now and in the future.

The immediate implications of this study for corporate managers and executives is to utilize the findings to identify and mitigate potential sustainability implementation risks that can lead to crises and damage organizational image, harm community welfare and destroy the environment. For instance, empowering the local residents' participation in sustainability design decisions will prevent unnecessary ferocious protests the 'less powerful' stakeholders whose aggrieved actions can damage corporate reputation. As a matter of fair business practice, designing sustainability practices proportionately and ethically will benefit corporations and society in the long run. The findings of this study also offer prospects for policymakers and governments in developing countries to rectify corporate sustainability policies that can foster fair allocation of royalties and taxes from multinational mining companies to the mining communities and to reduce rural poverty.

7.2 Limitations and future research

While our focus is a single case study of a multinational mining company subsidiary in Ghana and may require a cautious reproduction in different contexts, research suggests that findings from case study investigations can be generalized to other settings that display characteristics of the original study's context (Lee & Baskerville, 2003; Eisenhardt (1989). Future iteration of the study can also be explored through quantitative research where the modules of cohered emergent theory can be tested to evaluate the theory's application to designing and implementing sustainability initiatives in a greater scope. It is our hope to continue to apply cohered emergent theory in many contexts and transcend its theoretical merits to other disciplines where power relations, conflict of interest and emergent actuality must be simultaneously resolved to achieve better organizational or system design outcomes. Ongoing research projects applying the theory in Nigeria to implement enterprise policies/programs for businesses and to design employee reward packages for banks (DMU, 2021) underpin our claim. This supports the credence in cohered emergent theory as a nascent theoretical lens for exploring corporate responsibility and sustainability implementation in the future lines of inquiry.

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