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Green accounting practice: Political, legal and ethical insights, a focus on Zimbabwe coal mining sector

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Abstract

Green accounting and disclosure are very important when it comes to sustainable natural resources management of any nation. The purpose of this study was to investigate the effects of political landscape, the legal requirements and ethical practices on green accounting and disclosure. Guided by a pragmatism philosophy, a mixed methodology paradigm was adopted. A sequential explanatory research design was used to study annual reports from nine coal mining companies in Hwange district, followed by interviews with few experts who were purposively sampled. Data from annual reports was collected and analysed quantitatively using the content analysis method, followed by a thematic analysis of qualitative information collected through interviews. The study considered a period of five years, from 2017 to 2021. The study found that compulsory green accounting and disclosure received little attention in the coal mining sector. Furthermore, the paradigm shift in the political landscape created overprotection of politically negotiated coal mining investments at the expense of environmental protection. The study also found that there are weak legal enforcements systems. Considering the findings, the study concluded that there is no political will to protect the environment from its exposure to coal mining operations and there are insufficient legal tools, thus the study recommends aggressive education and awareness on environmental rights of varying interested groups and individuals to promote political will and incorporate green accounting requirements on pre-contract/license and post-contract/license coal mining conditions.

Keywords: Green accounting, cost management, environmental disclosure

1. Introduction

The concept of green accounting has evolved since the 1970's (Hecht, 2007; Hogner, 1982) ^[14] in the European countries. At its early development, green accounting also called environmental accounting was done through social and environmental accounting disclosures as part of annual financial reports. Such countries practicing green accounting were concerned about the depletion and destruction of their natural resources which form the basis of their economic performance. Netherlands, (Hecht, 2007) ^[14] developed a National Accounts matrix which included environmental accounts that takes account of degradation and depletion of environmental assets to measure national income and ensure protection of natural resources.

The general scientific view is that humans shape and craft the natural environment, hence they are participants and observers too (Jones, 2010) ^[18]. The impact of humans in the environment has led to continuous development of legal, ethical and accounting tools to manage, account and report adverse effects (Riberio, Aibar-Guzman, Aibar-Guzman, & Monteiro, 2016) ^[38] of companies' activities on the environment, which include among others global warming and climate change (Murombo, 2015) ^[27] resulting from greenhouse gas (GHG) emissions, land pollution and degradation, and depletion of natural resources. The so-called green economy has sparked so much debate in major conferences like the United Nations Conference on Sustainable Development (Riberio, *et al.*, 2016) ^[38] and the United Nations Climate Change (COP 26) Conference to map the way forward in managing, the environmental impact of companies' activities round the world. Of paramount importance, (Rounaghi, 2019) ^[40] is the external disclosure of production analyses, fixed costs control, capital budgeting and other financial matters of interest to financial communities and other interested stakeholders regarding the economic and environmental performances of operating companies?

A call for environmentally responsible and accountable operations by companies has been done also by the Organisation for Economic Co-operation and Development (OECD). Work has been done regarding regulating environmental accounting and reporting to mitigate the adverse effects of company operations in the environment. The public and private organisations that subscribe to good governance principles (Bowen, 2012; Riberio, *et al.*, 2016) [3, 38] have been subjected to immense pressure to balance economic growth and environmental protection, thereby making a concept of green accounting inevitable for reporting entities. Such companies as (Schmidt & Nakajima, 2010) [41] Fujitsu and Canon in Japan, Marouer Bier Breweries in Australia and Xerox European Photocopiers have immensely benefited from environmentally friendly accounting systems.

It has been accepted that while the industry is on record for having the highest negative environmental effects (Murombo, 2016) [28], there has been limited efforts to demonstrate how they are mitigating them using environmentally friendly systems. Companies have been marred to be resisting environmental accounting practice, giving relevance to a lot of debate in this area, while other authors have pointed out that all the problems (Murombo, 2016) [28] emanate from weak regulatory environment.

Green accounting systems are reinforced by IFAC, (2017) which submits that taking care of the environment has become an enormous global preoccupation, thus cost management for the environment (Christ, Burrirt, & Versei, 2016) [6] increasingly gaining significance as a consequence. It has been argued out that traditional accounting systems do not provide adequate information for environmentally friendly accounting systems (Jasch, 2006) [17] and to bridge the gap various countries have set up independent agencies to regulate the companies' environmental management responsibilities. Following the regulation of environmental management in the United States (US) in the early 1990s through the US Environmental Protection Agency (Jasch, 2006) [17], many countries round the world have put enormous efforts in promoting and implementing various forms of environmentally friendly management activities through their national agencies. Likewise, the International Accounting standards Board (IASB), drew much attention to the mining industry considered to be one of the sectors having an adverse impact on the environment, which it has regulated through issuance of International Financial Reporting Standard (IFRS) 6 (Corinne, Helen, & Mary, 2009) [7]. However, there are still arguments that IFRSs do not sufficiently cover environmental reporting requirements which in some nations depends on the national geography, hence the need for nations to establish national agencies to regulate environmental accounting practices.

South Africa remains one of the largest per capita GHG emitters in the world (Murombo 2016) [28] especially in the energy sector, but attempts to reform the regulatory framework have been proceeding very slow. The Integrated Reporting Committee was established to provide the guidelines in preparing the intergrated reports, chief amongst them being environmental accounting. Due to growing concerns, the Intergrated Reporting Committee was later transformed to International Reporting Council to regulate environmental accounting among other objectives the world over. According to, South Africa is one of the countries that have been heavily punishing companies for

activities that cause environmental damage and as well pushing for environmental audits in a bid to enforce environmental accounting and reporting (Otekunrin, Samu, Sifile, & Mutowanyika, 2021) [36]. The country has been joined by Botswana, Namibia and Kenya by making it mandatory for listed companies to report the effects of their activities on the environment, thus making significant strides towards green accounting.

In Zimbabwe (Otekunrin, *et al.*, 2021) [36] companies still focus on profit maximisation, with little regard to the implications of their operations on the environment they are operating in. The mining sector is key to economic recovery (Murombo, 2016) [28] but however it has been identified as having the most adverse effects on the environment. There are several pieces of regulation (Murombo., 2016) [28] that attempt to regulate environmental accounting in Zimbabwe. Among the main regulatory frameworks, the mines and minerals act and the environmental management act govern natural resources and control pollution for sustainable environmental reporting. While in developed countries, corporate organizations ensure voluntary information reporting of its efforts to protect the environment, Zimbabwean companies are not giving honest and credible information about effects of their activities on the environment. In some cases the establishment of extractive sector companies have been viewed to be satisfying political interests at the expense of the environment and its participants. In other instances environmental misdeeds have been viewed as an ethical misnormar perpetrated by companies in the hands appropriate regulation.

Zimbabwe of late, especially in the mining town of Hwange, have experienced intensive clashes between the authorities and interested community stakeholders, trying to enforce modification of new companies's operations to mitigate damage and uphold green accounting. (Olubunmi, 2022) [11] argued that green accounting practice intergrates adequate reporting of effect of management of natural resources and economic performance to shareholders' expectations. The observations have however been that besides land and air pollution, the extractive sector have canalized distraction of natural vegetation and disrupted natural ecosystems in the national park by driving wildlife to neighbouring countries among others, without much benefit expected by affected communities from operating companies hence drawing the following study objective and question:

Research Objective: To investigate Political, legal and ethical (PLE) effects on green accounting

Research Question: How do Political, Legal and Ethical practices affect environmental/green Accounting. The study considers that companies in the extractive sector are not doing enough to account for environmental costs. The laws (Otekunrin, *et al.*, 2021) [36] are silent on this and there are insufficient strategies to enforce environmental accounting. With the look east economic policy, political interests are taking precedence in the extractive sector in pursuit of the National Development Strategy (NDS), creating a gap and oversight in the design and enforcement of corresponding appropriate legal framework for environmental accounting and reasonable ethical conduct by operating companies. As a result extensive unaccounted environmental damage by operating companies is witnessed without much benefit to local communities. This article therefore seeks to investigate the effects of political, legal and ethical effects on green

accounting in pursuit of effective and sustainable coal mining operations in the Zimbabwean context.

2. Understanding theory and the concept of green accounting

The first subsection discusses the framework of legitimacy, stakeholder and intergenerational equity theories. The next summarises the concept of green accounting followed by the role of government in environmental management, and an overview of political, legal and ethical insights.

2.1 The Legitimacy theory

(Maama & Appiah, 2019; Ramdhony, 2015; Ghosh, 2015; Wong, 2011) ^[24, 37, 12, 45] used legitimacy theory to evaluate Green Accounting and disclosure practices. To obtain community support (Alawi & Rahman, 2011) ^[2] compliance by reporting companies must not only be done, but must be seen to be done, by communities and other stakeholders in which the reporting entity operates. Reporting companies therefore are required (Maama & Appiah, 2019) to be more than just compliant, in fact more ethical and voluntary disclosure of green accounting information would convince the communities that companies' activities are sustainably within the confines of applicable regulation.

The theory of legitimacy holds that (Wong, 2011) operating entity reports are evaluated for compliance to applicable regulation and if the contrary exist, prosecution will follow. A case in point, following prosecution for non-compliance to environmental disclosure requirements (Maama & Appiah, 2019) an Australian company was found to have disclosed more information than those that were not prosecuted in the following year, thus strengthening legal systems an enabler of appropriate green accounting practice and disclosure.

2.2 Stakeholder theory

While operating companies aim to maximise profits for their shareholders (Esteves & Barclay, 2011), they also have a duty for other stakeholders. This theory borrows much from the legitimacy theory as the expectations of stakeholders largely depends on what has been considered as the minimum requirement by applicable legislation. Stakeholder theory (Maama & Appiah, 2019) acknowledges various stakeholders who include among others individuals, groups of individuals, or institutions interacting with the reporting company who may have diverse expectations (Kamla & Rammal, 2013) on the extent of disclosures considered appropriate. A study by Esteves and Barclay (2011) ^[9], looked at community partnerships and stakeholder relationships with regard to green accounting and disclosure, (Wong, 2011) looked at firms choices to meet stakeholder expectations at firm level, but no one has investigated the interests of political groups at group level as stakeholders to Green Accounting and disclosure.

2.3 Theory of intergenerational equity

This theory holds that non-renewable energy cannot be substituted if depleted (Maama & Appiah, 2019; Abeysekera, 2013) ^[24]. The need to equitably distribute natural resources among present and future generations (Wild & van Staden, 2013) arouse stakeholder interests to keep in check for sustainability of operations by operating companies for future generations benefit, thus ethical and

voluntary disclosure of information being paramount. The theory builds on both the legitimacy and stakeholder theories

2.4 The concept of Green/Environmental Accounting

The disclosure of environmental protection and accounting, cum green accounting (Olubunmi, 2022) ^[34], has been argued to be voluntary as most companies wouldn't want to be associated with controversies which may damage their reputation. However in some parts of the world, especially developing countries reporting numerical accounting information of companies' effort to protect the environment has been viewed as optional (Olubunmi, 2022; Nabiz & Hirzel, 2020) ^[34] owing to weak and corrupt regulators.

Traditional accounting methods (Nyakuwanika, Poll, & Poll, 2021) had short comings in accounting for environmental costs, which increasingly became essential in order to mitigate the effects of companies' operations on the environment during the last two decades. An endeavor to develop a more meaningful system has led to development of Green Accounting Accounting practices such as Environmental Management Accounting (EMA), Environmental Accounting (EA) and Intergrated Reporting (IR) among other attempts to regulate green accounting.

EMA, is of the view that it should be a mechanism to measure the full spectrum of environmental costs for current production processes and economic benefits of pollution prevention or cleaner processes and intergrate these costs and benefits into day-to-day business decision making. Thus (Nyakuwanika, *et al.*, 2021; Burritt, Hahn, & Schaltegger, 2002) ^[5, 33], argues that EMA deals with the accounting systems meant for internal reporting and decision making, and is comprised of Monetary Environmental Management Accounting (MEMA) and Physical Environmental Management Accounting (PEMA). According to Burritt, *et al.*, (2002) ^[5], MEMA addresses company activities which are expressed in monetary values. The accounting system traces down the costs and revenues arising from companies' activities which have an environmental impact for the purposes of control and accountability. On the other hand (Nyakuwanika, *et al.*, 2021; Muza, 2018) ^[33, 29], jointly suggest that the PEMA accounts for physical units like labour hours or kilograms that relate to the impact of companies' activities on the environment. Thus, the PEMA and MEMA feeds on one another for company decisions that promote environmental management.

It is apparent that without meaningful EMA, external environmental reporting is next to none. PEMA and MEMA uses management accounting methods to derive costs relating to environmental impact of reporting entities' operations. Methods (Nyakuwanika, *et al.*, 2021) ^[33] such as Material Flow Cost accounting, Lifecycle Costing, Activity Based Costing are paramount in Environmental Management Accounting.

External Reporting (ER) focusses on disclosure of environmental accounting information regarding the extent to which the company sustainably finance environmental costs which are a consequence of its operations. This is alluded to by, who states that External reporting encompasses estimation of environmental impact and assesment of company resources in the context of EMA. Attempts to reignforce environmental reporting for operating entities further developed as a corporate governance issue in the form of Intergrated Reporting. Organisations (King, 2016)

must take responsibility for the environmental outcomes of their activities and outputs and in the interest of their stakeholders, report sustainably as part of their intergrated reporting system. The qualifying information for reporting

to external stakeholders is a direct deduction from MEMA and PEMA as shown in the Green Accounting reporting Framework below:

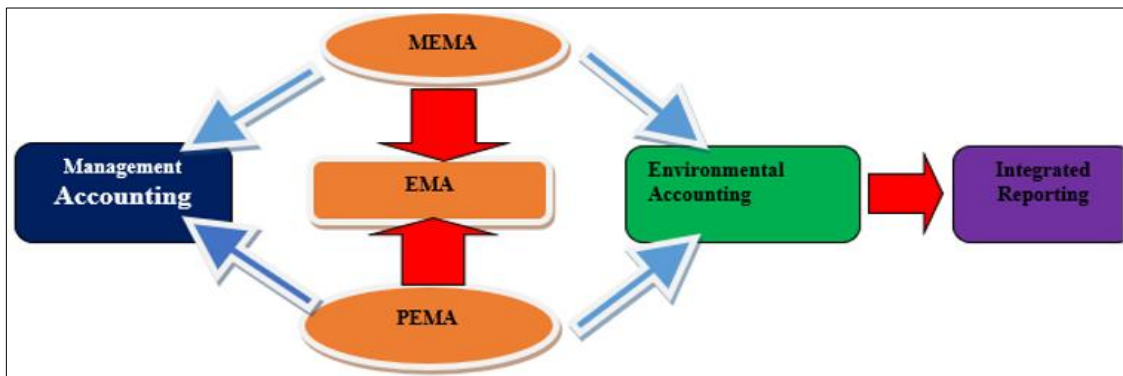


Fig 1: Green accounting reporting framework

Acknowledging that previous researchers on environmental accounting in the Zimbabwean context, (Nyakuwanika, *et al.*, 2021) ^[33] focused on the Gold mining sector, with specific reference to management accounting processes, and the extractive industry wide (Muza, 2018) there have been a paradigm shift in political, legal and ethical business environment within the recent publications. This calls for a fresh investigation for possible ways of ensuring Green Accounting Practice, with specific focus to coal mining, a sector considered number one in environmental damage.

2.5 Role of government in Green accounting

The government is an agent, for whom the principal is its citizens and businesses within its borders (Feldman, Hadjimichael, Lanahan, & Kemeny, 2016). Its principal role is to be an inclusive vehicle for organising economic, social and civic life. The government seeks to allocate the resources for collective good, hence the aspect of sustainable development gaining significance (Nyakuwanika, *et al.*, 2021; Van de Walddt, 2016) ^[33, 42]. Sustainable development requires an intergrated environmental protection and economic growth.

In promoting sustainable development the government balances the needs of current and future generations, and non-humans to maintain healthy ecosystems (Nyakuwanika, *et al.*, 2021; Van de Walddt, 2016) ^[33, 42], hence the need for the government to allocate and regulate the distribution and consumption of its natural resources (Otekurin, *et al.*, 2021) ^[36]. Government regulation provides formal guidelines, however, there is also need for informal guidelines in the form of norms, values and shared beliefs to ensure social sustainability and ethical disclosure (Kelling, Sauer, Gold, & Seuring, 2020).

In some countries governments play an important role in developing policy framework so as to comply with international reporting standards (Otekurin, *et al.*, 2021; Hoshino, 2017) ^[36]. Most European countries and the United States of America (USA) have effective environmental management accounting frameworks (Otekurin, *et al.*, 2021; Weibust, 2016) ^[36, 43] and so is South Africa through their governance framework, the King IV report. The success of environmental accounting largely depends on government's ability to provide effective frameworks establishing companies and the ability to monitor compliance.

In the Zimbabwean context, researchers and other stakeholders have come out guns blazing to the government for failing to fulfil its roles regarding green accounting and environmental disclosures, especially in the extractive sector. As suggested by (Otekurin, *et al.*, 2021) ^[36] the Zimbabwean government need to introduce mandatory green accounting policy for all operating companies, provide fiscal support and provide incentives for compliance to enhance sustainable operations in the coal mining sector. Otherwise there is need to investigate if the government is playing its role appropriately from registration to legal compliance from environmental accounting and disclosure perspective by operating companies in the coal mining sector.

2.6 Political influences in the context of Green Accounting

In any nation, politics have a significant influence in shaping the economic policies a country would follow. Under no circumstances would politicians allow implimentation of economic policies that would make themselves unpopular. In the Zimbabwean context the country has sought economic alliances with the Chinese government (Younde, 2007) since as early as 2000. This is witnessed by a number of business deals that have been sought by the government to date and since then, the Chinese investors have multiplied in numbers especially in the extractive sector. Of late, relations appear to have been much stronger as witnessed by influx of Chinese owned coal miners and coke processors in Hwange. Production from these and other companies in the extractive sector is key to achievement of National Development Strategy (NDS) 1 in pursuit of Zimbabwe Agenda 2030, hence paramount for continued existence of political power. While it has been acknowledged by most researchers (Murombo., 2016; Younde, 2007) ^[28] that the extractive sector plays a critical role in contributing to national development, little has been considered on environmental impact of the shift in political dimensions resulting in massive investments in the extractive sector met by nenerous calls for green accounting and disclosures.

2.7 Green Accounting Legal environment

The growing concern for environmental management has resulted in international accounting regulatory bodies

establishing minimum requirements for green accounting and disclosure which have been mostly adapted and incorporated to local laws for most countries. The amount of environmental disclosures by operating companies have received so much attention by researchers (Riberio, Aibar-Guzman, Aibar-Guzman, & Monteiro, 2016) [38].

In an effort to regulate the extractive industries, the international Accounting Standard board issued International Financial Reporting Standard (IFRS) 6 (Corinne, *et al.*, 2009) [7], but it has received so much criticism for failing to bring up sufficient disclosures (Muza, 2018; Corinne, *et al.*, 2009) [29, 7]. It is arguable that the amount of disclosures is not universal, it will vary from country to country depending on nature and size of reporting companies' operations. In the USA, green accounting and disclosure is rules based and there is high rate of compliance (Muza, 2018) while in the UK its more voluntary. However compliance rate is also high. Developed countries have been evaluated as having strong legal compliance and enforcement systems (Kurauone, *et al.*, 2021) [23] when compared to developing nations. In South Africa and most developing countries environmental accounting and disclosure is both rules based and voluntary, as shown by being incorporated as one of the Stock Exchange listing requirements. Some requirements have become voluntary through the governance Intergrated Reporting system.

In the Zimbabwean context, the legal instruments regulating green accounting and disclosures (Nyakuwanika, *et al.*, 2021; Muza, 2018) [33, 29] are pivoted in the Environmental Management Act chapter 20:27, other acts that include the mines and minerals act chapter 21:05 and the stock exchange act chapter 24:18. The Rural District Councils Act chapter 29:13 and Urban Councils Act chapter 29:15 draws its environmental management disclosure requirements from the Environmental Management Act.

The Environmental Management Act establishes the standards Enforcement Committee to superintend compliance to regulatory requirements with regard to environmental accounting (Muza, 2018) and disclosures, require Environmental Impact Audits before commencement of projects and provides cancellation of compliance certificate for breach of environmental disclosure requirements. However, the act does not provide intervals or circumstances that give rise to follow-up environmental audits so as to prevent non-compliance, save for the assessment by the Director General. For a common cause, operating companies would always present themselves to comply with requirements in their self-generated periodical compliance evaluation reports to Director General, if ever they do submit. The act empowers the relevant ministry, and local authorities to enforce compliance to environmental accounting and disclosures but however companies in the extractive sector (Nyakuwanika, *et al.*, 2021; Otekunrin, *et al.*, 2021; Muza, 2018; Murombo, 2016) [33, 36, 28, 29] have been heavily criticised for perpetual environmental damage in the presence of these enforcement agents. (Otekunrin, *et al.*, 2021; Muza, 2018; Murombo, 2016) [36, 28, 29] argue that

there is insufficient environmental accounting, disclosure and regulatory framework, without stating what is sufficient, and it is unclear if also political and ethical influences play a role in non-compliance.

2.8 Understanding Green Accounting Ethics

The presence of regulation does not guarantee compliance by operating companies with regard to environmental accounting and disclosure. The importance of ethical business conduct (Kelling, *et al.*, 2020) is demonstrated by the collapse of Roma Plaza in Bangladesh, the Tailing dam tragedy in Brazil and the Marikarna Strike in South Africa among other ethical institutional voids. (Golicic, Lenk, & Hazen, 2019) posits that ethical issues for operating companies arise due to lack of social performance which prevents social sustainability. According to (Kelling, *et al.*, 2020), companies especially in the mining sector contribute to the host community through developmental projects and environmental protection resulting from their operations must be appropriately disclosed regardless of the disclosure being a prerequisite for license renewal, thus an institution gives a meaning to what is perceived an ethically correct action. This was alluded to by Muza (2018) [29], who holds that in developed countries social disclosures with regard to environmental protection among others, are considered an ethical procedure and are done on voluntary basis. In fact in USA (Muza, 2018) companies with more social disclosures perform better than those without, hence the concept of ethical, social or environmental disclosure gaining prominence.

It is not uncommon in the developing countries, Zimbabwe included, that companies especially in the extractive sector (Murombo, 2016) [28] are resisting ethical disclosures with regard to the environment, giving relevance to a lot of debate in this area and thus being an ethical misnormar regarding social sustainability reporting. In the case of Hwange District, it is unclear how the companies in the coal mining sector are socially and ethically responsible, especially with regard to the environment where consequences of their operations are being experienced. In the extractive sector Green Accounting practice remains a mystery in the hands of supporting regulation, *et al.* one it being an important ethical disclosure for operating companies.

3. Research methodology

Informed by a pragmatism philosophy, the study employed a mixed methodology paradigm (Fischler, 2021; Creswell, 2014) to enable more reliable results to be derived from both qualitative and quantitative methods. A sequential explanatory research design was employed as a means of collecting and analysing both quantitative and qualitative data. Collection of qualitative data was informed by quantitative analysis (Fischler, 2021) as shown in figure 1.2 below. The results from the two investigations were analysed and interpreted separately, but concurrently presented.

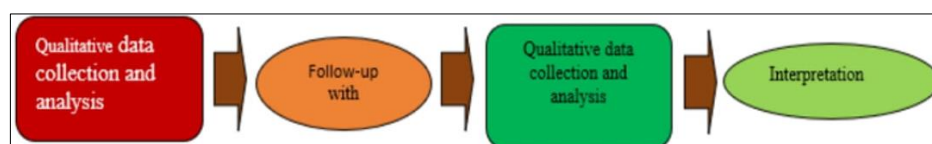


Fig 2: Sequential explanatory design from Fischler, 2021

The target population were twelve (12) coal mining and/or processing companies operating in Hwange district. With the population being small, data from all the twelve companies was considered for quantitative analysis. Out of twelve (12), nine (9) companies released their annual reports for years 2017-2021 for intensive examination and content analysis for green accounting disclosures. Analysis of these annual reports was done by eight independent Accounting Professionals, save for one report on each of the years 2017, 2019 and 2021 which were missing. Each Accounting Professional coded data from a set of nine companies's annual reports for years 2017 to 2021. Coding was based on pre-set guidelines in the form of an evaluation matrix (Maama & Appiah, 2019; Marx & van Dyk, 2011) [24] presented on appendix 1, where mean scores of green accounting disclosures based on perceived use fullness (Maama & Appiah, 2019) [24] were captured using a 5-point likert scale. The level of usefulness was guided by fundamental and enhancing characteristics of financial statements (Ncube, 2020) [31] enshrined in International Accounting Standard Board (IASB) Conceptual Framework for Financial Reporting. Categories of very minor or no disclosure, minor disclosure, average disclosure, large disclosure and full disclosure were represented by a likert scale one (1) to five (5) respectively. The data was tabulated

and analysed using descriptive statistics with the aid of Microsoft 365 excel application.

On qualitative analysis four experts, each purposively selected from Environmental Management Authority (EMA) of Zimbabwe, Ministry of mines and mining development, ministry of finance, and ministry of industry and commerce were interviewed. The in-depth interview guide was tested for validity using the Lawshe's 1975 model of assessing content as cited in (Risnamhodzi & Ncube, 2022; Kuraone, 2021) [31-23] (appendix 3). Ten (10) experts evaluated the content using the Content Validity Ratio and a minimum of 0.78 (Risnamhodzi & Ncube, 2022) [32] was considered. All items that passed the minimum score were included in the interview guide.

$$CVR = \frac{(n_e - 0.5N)}{0.5N}$$

Where CVR is the content validity ratio

n_e is the number of experts observing the content as relevant to be researched.

N is the total number of experts in the panel

4.0 Results

The results of the extent to which green accounting is practiced as regulated, is presented on table 1.1 below.

Table 1: Coal Mine companies' Green accounting disclosures required by law

Disclosure Matrix Question (DMQ)	2017	2018	2019	2020	2021	Mean Disclosure: Per question
DMQ 1	2.47	2.40	2.31	2.58	2.99	2.55
DMQ 2	2.5	2.49	2.54	2.5	2.31	2.47
DMQ 3	2.47	2.51	2.69	2.71	2.42	2.56
DMQ 4	1.78	2.0	2.18	2.54	2.61	2.22
DMQ 5	2.04	2.38	2.31	2.28	2.24	2.25
DMQ 6	1.99	2.50	2.38	2.38	2.18	2.28
DMQ 7	2.60	3.0	2.36	2.43	2.44	2.56
DMQ 8	2.29	2.11	2.11	2.08	1.97	2.11
DMQ 9	3.25	3.15	3.0	2.94	2.41	2.95
Yearly Mean Disclosure	2.37	2.50	2.43	2.49	2.39	2.44

Table 1.1 presents green accounting disclosures by coal mining companies that are required by the Environmental Management Act (EMA) Act Chapter 20:27. On the overall, content analysis of annual reports revealed that compulsory green accounting practice and disclosure received little attention in the coal mining sector from year 2017 to 2021, with an overall mean disclosure score of 2.44 on the likert scale. The table further shows that there was no improvement in the amount of disclosures during the period under review as shown by an almost the same yearly mean scores from 2.37 in year 2017 to 2.39 in the year 2021, regardless of this sector (Muza, 2018; Murombo, 2016) [28, 29] being the leader in environmental pollution.

Follow-up interviews revealed that a paradigm shift in the political landscape created overprotection of politically negotiated investments, most of which being in the coal mining sector, at the expense of environmental protection. These results revealed that the political will for economic improvements overshadows environmental protection in many ways, which compromise efforts of responsible stakeholders to ensure environmental protection through green accounting and disclosure practices.

While the legal provisions (Murombo., 2016) [28] have been criticised as insufficient for effective protection of the environment, results from interviews suggest that there are

weak legal enforcements of environmental laws in the coal mining sector, with most mining firms having a political backup emanating from (Younde, 2007) the look east policy in pursuance of the National Development Strategy (NDS). This view is also suggested in table 1.2 by an overall mean score of 1.36 for DMQ 14 (disclosure of environmental audits) and 1.05 for DMQ 12 (disclosure of fines and penalties). There is no evidence at all on the extent to which Environmental Management Authority (EMA) of Zimbabwe and other responsible authorities enforce environmental laws beyond initial environmental impact assessment done for the purposes of licencing, thus suggesting (Kuraone, et al., 2021) [23] weak legal enforcement systems. In the following paragraphs, results for each assessment area is discussed in detail.

4.1 Efforts to reduce effects of dangerous emission and disclosure of targets (DMQ1)

Emissions are one of the targeted areas in green accounting and disclosure for coal mining and processing firms. Showing on table 1.1, the overall mean score for this assessment disclosure is 2.55, considered average. Most Annual Reports of firms quantified their commitments of resources spent to reduce effects of emissions in their financial statements. In one annual report for a company

listed in the zimbabwe stock exchange, quantified disclosures were traced to expenditure section of financial statements while targets for the next five years on emissions were explicitly stated in the Chairman's report. However this was contradicting with the mechanisms for attaining long term targets on emissions since on table 1.2 DMQ 13 (disclosure on green accounting investments), DMQ 11 (disclosure of efforts to engage in energy efficient operations) had 1.02 and 1.15 overall mean disclosure scores, suggesting an unclear roadmap towards achieving the set targets. For most coal mining firms, most of which are not listed in Zimbabwe Stock Exchange, absence of green accounting investments and efforts to engage in energy efficient operations could be caused by insufficient regulation (Murombo, 2015) ^[27] and poor (Muza, 2018) ethical reporting systems evidenced by the overall mean score of 1.3, coupled with weak legal enforcement systems (Kurauone, et al., 2021) ^[23].

4.2 Quantified Efforts to prevent land degradation (DMQ 2)

Coal mining activities affect both humans and non-humans' right to use land, bearing in mind that most mining activities in the coal rich Hwange are in the National Park. Table 1.1 shows an overall mean score of 2.47 on this area of assessment for the years 2017 to 2021. Quantified efforts to prevent degradation and restore land were observed in financial statements disclosures, provisions and asset valuations which accommodated land restoration expenditures beyond mining activities in compliance with (Corinne, et al., 2009) ^[7] International Financial Reporting Standard 6 (Exploration for and evaluation of mineral resources). While the disclosures may seem to be complying with the requirements of accounting regulation, there is need for more disclosures to ensure sustainable coal mining operations.

4.3 Efforts for sustainable use of coal resources for economic growth (DMQ 3)

Coal is a form of non-renewable energy and cannot be substituted once depleted, thus it must be utilized for maximum economic growth in order to benefit the present and future generations. The results presented in table 1.1 indicate an average green accounting disclosure in this assessment area (DMQ 3) with a mean score of 2.56 for the five years under review. Most annual reports in the chairman's report disclosed their firms' contribution to the National Development Strategy. This is in agreement with the findings of (Nyakuwanika, et al., 2021; Otekunrin, et al., 2021; Muza, 2018; Murombo, 2016) ^[33, 36, 28, 29].

4.4 Efforts on environmental awareness (DMQ 4)

Communities where there is no awareness on environmental protection, become victims of their own environment in the form of distorted weather patterns due to pollution, release of hazardous effluent, polluting both land and water sources, and incidents relating to dumping of dangerous substances among other effects. The results on table 1.1 show an average mean score of 2.2 for this assessment area DMQ 4 on environmental education and awareness. A closer analysis reveal minor disclosures with a mean of 2.0 in the first two years of assessment which later improved to 2.61 in the last assessment year. The growing interest of social sustainability of mining operations (Golicic, et al., 2019) by

local communities is attributed to increased resource allocation for environmental education and awareness by mining operations. Results from the interviews allude to content analysis in that interviewees cited the growing concerns from local communities (Mataishe, 2022; Ncube, 2021) ^[32] regarding failure by coal mining firms to commit resources towards environmental education and protection, thus resulting in unpleasant accidents where community members are burnt in coal fire dumpsites, and contamination of water sources with hazardous substances. Such community interest have been cited on interview results as a significant step towards arousing political will on environmental accounting and disclosure.

4.5 Interstakeholder environmental management (DMQ 5) and human environmental rights (DMQ 6)

Collective effort for companies in the same trade and at times across industries is paramount if effective environmental accounting and disclosure is to be attained. The results on inter-stakeholder quantifiable commitments on table 1.1 show that there are minor disclosures on joint inter stakeholder efforts for green accounting with a score of 2.24 on criteria DMQ 5. Assessed annual reports do not show amount of resources pulled for joint effort to manage the adverse effects of mining operations to local communities.

Coal mining operations have been viewed in many (Murombo., 2016) ^[28] instances as an industry that affects local communities' environmental rights which include among others the right to healthy ecosystems, clean water sources and clean air among others. Disclosure of efforts made by coal mining firms to minimise actual and potential negative effects to people's environmental rights are presented in table 1.1. An overall mean score of 2.28 for the period 2017 to 2021 suggest that there are minor disclosures in this assessment area.

4.6 Efforts to minimise health effects of unavoidable emissions and waste management

Coal mining operations are associated with unavoidable emissions with negative health effects (Murombo., 2016) ^[28]. Green accounting in such instances enables disclosure of resources in setting up and funding medical facilities and services as a plough back to the affected communities. Results in table 1.1 on DMQ 7 assessment criteria has an overall mean score of 2.56 suggesting an average disclosure of quantifiable efforts to minimise unavoidable health effects. On most annual reports analysed, information relating to funding community health delivery facilities and services was traced to the expenditure section of annual financial statements to some extent, but was clearly stated in the Chairman's report as a Corporate Social responsibility item. Results from interviews alludes to that in fact funding community health delivery systems is an ethical plough back mechanism that the host community (Kelling, et al., 2020) and the nation at large would appreciate.

Discharge of waste is unavoidable where coal mining activities are taking place, thus the need for commitment of resources on effluent treatment and waste recycling by operating firms. The results on table 1.1 indicate an overall mean score of 2.9 for assessment area DMQ 8 for the period under review suggesting above average quantified green accounting disclosures for waste treatment and recycling. All annual reports assessed for the period under review had

significant quantified green accounting disclosures owing to supervision of this area by the Ministry of Industry and Commerce through the Standards Association of Zimbabwe (SAZ).

4.7 Overall results on ethical/voluntary disclosures

The overall results on ethical and voluntary green accounting disclosure are presented in table 1.2 below:

Table 2: Coal companies' ethical/voluntary disclosures

Disclosure Matrix Question (DMQ)	2017	2018	2019	2020	2021	Mean Disclosure: Per question
DMQ 10	2.19	2.15	2.13	1.90	1.86	2.05
DMQ 11	1.11	1.18	1.15	1.5	1.15	1.15
DMQ 12	1.07	1.06	1.06	1.03	1.03	1.05
DMQ 13	1.0	1.0	1.06	1.06	1.01	1.03
DMQ 14	1.57	1.46	1.36	1.24	1.18	1.36
Yearly Mean Disclosure	1.39	1.37	1.35	1.28	1.25	1.33

On the overall, content analysis of annual reports showed a mean score of 1.33 for ethical and voluntary disclosures suggesting that there are minor disclosures for DMQ 10 to 14 assessment areas. The non-disclosure of amounts on significant fines and penalties on DMQ 12 could be a consequence of poor legal enforcement (Kurauone, et al., 2021) ^[23] systems on green accounting practice and disclosures as has also been suggested by results from interviews. The results concur with the findings of (Kelling, et al., 2020; Muza, 2018) ^[29] who held that operating companies in developing countries are not willing to make ethical and voluntary environmental disclosures, they consider the practice an unnecessary expense.

5. Implications of the study

Green accounting information goes beyond the government for policy making and the public in general on their individual capacities and their environmental rights. The information also serves varying interests of communities as groups of current and future generations in a quest for sustainability of natural resources, interests of political groups to balance political goals with sustainable natural resources benefits and also groups of other interested stakeholders. Non-humans, specifically animals, also have rights to the environment that require addressing in green accounting practice and disclosure to promote healthy ecosystems, that are paramount for economic growth. It could be understood therefore that green accounting and disclosure is paramount to individuals, firms, governments, community groups, political groups, and non-human elements of the ecosystems for both sustainable governance and management of public resources.

6. Conclusions

In light of the findings, the study concludes that legal enforcement on green accounting and disclosure in the coal mining sector is compromised by absence of political will and support. The study holds that political will activate and empower authorities to enforce using applicable regulations. Further the study concludes that there are insufficient legal tools, that is licensing and enforcement frameworks, to ensure effective green accounting and disclosure. The study also concludes that the annual reporting culture for the coal mining sector does not promote ethical and voluntary disclosure of green accounting information.

7. Recommendations for action

The study recommends that the Zimbabwe Environmental Management Authority, coal mining firms should promote awareness on environmental education and bargaining power of communities and other stakeholders as groups, to

hold operating companies to account for consequences of their operations on the environment, thus arouse the political will for both compliance and legal enforcement. Further the study recommends that the government should incorporate green accounting requirements on pre-contract or license conditions and establish a clear post-license environmental audit intervals for both listed and unlisted coal mining companies as an amendment to the Environmental Management Act Chapter 20:27. The study also recommends that the government should introduce incentives for compliance to promote ethical and voluntary green accounting and disclosure as a way of modelling ethical annual reporting culture.

7.1 Recommendations for further studies

Ethical and voluntary disclosures are cultural aspects that are key to successful green accounting and disclosure. Empirical evidence is required on green accounting incentives that may be considered to promote a business culture of ethical and voluntary green accounting practice and disclosure.

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Appendix 1

Green Accounting and Disclosure Evaluation matrix

Green accounting disclosure required by law						
Disclosure of information					Likert scale score	
		1	2	3	4	5
DMQ 1	Quantified efforts to reduce effects of dangerous emissions and disclosure of measurable targets					
DMQ 2	Quantified efforts to prevent land degradation during and after mining activities					
DMQ 3	Quantified efforts for sustainable management and use of coal resources while promoting economic growth and social development					
DMQ 4	Quantified efforts on environmental education and awareness to affected communities					
DMQ 5	Quantified efforts for inter stakeholder environmental management practice					
DMQ 6	Quantified efforts to reduce or minimise actual and potential negative effects to people's environmental rights					
DMQ 7	Quantified efforts to minimise health effects of unavoidable emissions in communities where operations are done					
DMQ 8	Quantified efforts to conform to international standards of environmental protection					
DMQ 9	Quantified efforts on waste discharge and recycling					
Ethical /voluntary Green Accounting disclosures						
DMQ 10	Quantified efforts to reduce actual and potential negative effects on rights of non-humans					
DMQ 11	Quantified efforts to engage in energy efficient operations					
DMQ 12	Disclosure of significant fines and penalties for non-compliance					
DMQ 13	Quantified efforts environmental protection investments					
DMQ 14	Disclosure of routine environmental audit reports and social activities					

Likert Scale Key: Scale 1: Very minor or no disclosure, Scale 2: minor disclosure, Scale 3: average disclosure, Scale 4: large disclosure and scale 5: full disclosure.

Appendix II

In depth interview questions

- About the environment, may you highlight the legal requirements that must be satisfied before a mining license is awarded?
- To what extent do contractual obligations for a licence to carryout mining activities relate to green accounting and environmental disclosure?
- Most investments in the coal mining industry have Chinese origins, what do you think could be leading to this scenario?
- Statistics gathered reflect gross non-compliance to green accounting disclosures. Would you think that the Zimbabwe political landscape has a role that it plays or fails to play resulting in non-compliance to green accounting and related disclosures?
- What is your comment regarding the adequacy of legal provisions requiring green accounting and disclosure by coal mining companies?
- What legal enforcement mechanisms are used to enforce compliance to green accounting and environmental disclosure? How would you rate their effectiveness? Would you think this situation is anyway linked to the Zimbabwe political landscape?
- What do you have to say about the ethical conduct of coal mining firms regarding green accounting and disclosure? What makes you say coal mining operators avoid ethical and voluntary disclosure?

Appendix III

Lawshe's Content Evaluation Matrix

Relevancy	Clarity	Score
Irrelevant	Unclear	1
Major Revision required	Major revision required	2
Considered with minor revisions	Considered with minor revision	3
Very relevant and considered	Very clear and considered	4

Note: Only items with a rating score of 3 or 4 were considered as necessary items worthy to be researched

Items worthy to include in interview guide	Relevant and clear (3 or 4)	Irrelevant and unclear (1 or 2)	$\frac{(n_e - 0.5N)}{0.5N}$	Decision
Adequacy of legal requirements	10	0	1	Appropriate and include
Green reporting expertise	8	2	0.6	Inappropriate and do not include
Contractual obligations	9	1	0.8	Appropriate and include
Influence of politics on green accounting	10	0	1	Appropriate and include
Corruption	8	2	0.6	Inappropriate and do not include
Legal enforcement mechanisms	10	0	1	Appropriate and include
Green accounting Reporting ethics	9	1	0.8	Appropriate and include

Note: Items with a score exceeding 0.78 were included in the interview instrument