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SUSTAINABLE MANAGEMENT STRATEGIES FOR ATTAINING COMPANY'S GOALS IN THE ZIMBABWEAN MINING INDUSTRY

JUET NYAMUDZODZA[1] OBERT SIFILE[2] AND ADMIRE MTHOMBENI[3]

Abstract

The aim of the study was to determine the impact of adopting sustainable management strategies on the attainment of a company's goals in the Zimbabwean mining industry. The study adopted a quantitative research approach. Structured questionnaires were administered to a sample size of 278 respondents that was calculated using the Raosoft sample size calculator with a 5% margin of error, 95% confidence interval and 50% response distribution. A cross-sectional survey research design was used with stratified random sampling techniques. The study is hinged on the Resourced Based View Theory. Data were validated through exploratory factor analysis and the triangulation approach to ensure that meaningful findings were obtained. It was then analysed using SPSS® version 21 and AMOS® version 21. Results obtained show that adoption of sustainable management strategies results in environmental balance and social progress, increase productivity and reduce operational costs and eliminate risk posed by mining operations to humans and wildlife. The findings also show that there is a strong positive relationship between sustainable management strategies and company performance. The study recommends the alignment of company strategies to both the internal and external environment since they both influence the future position of the business. For improvement of current study results, the study recommends that future studies be carried out across all provinces in Zimbabwe to improve operational efficiency of mining companies. In addition, comparative studies among other related business sectors are also recommended.

Keywords: eco-friendly mining, socio environmental responsibility, air pollution, mining legislation, mining research and development

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INTRODUCTION

Measham (2013) opines that mining is causing more harm to the environment although it is the backbone of many economies worldwide. Without doubt, mining has opened many opportunities in countries through employment creation, building and sustaining relationships between nations. The notion is supported by Bolong (2016) who is of the view that mining causes much irreparable damage to the environment that affects people in surrounding communities. White (2013) advances that failure by owners of mining companies to adhere to regulations imposed by responsible authorities is one of the major reasons that have led to environment degradation as the owners will be complacent knowing that whatever they do they will not be traced and made accountable.

When diamonds were first discovered in Manicaland, Zimbabwe, communities took it as a blessing but today there is now an outcry due to the damage that has been caused by the mining companies (Katsauar, 2010). In 2016, local communities had hope about environmental protection and community development when the government of Zimbabwe backed the Zimbabwe Consolidated Diamond Company, but nothing changed on the ground. Kingstone Chitotombe the regional manager for the Environmental Management Agency (EMA) confirmed that the mining company was operating without an Environmental Impact Assessment certification which helps in coming up with a plan to minimise the rate of environmental damage. A docket was opened by EMA as a way of trying to push the company to apply for a certificate (Zimbabwe Environmental Law Association, 2012). The environmental damage caused by the Zimbabwe Consolidated Diamond Mining Company was well noted and documented. One of the concerns raised was that of water pollution as chemicals for cleaning the diamonds were found in river sources. Some of the community members complained that some of the water sources that were once used for drinking water were no longer safe as the water was causing an irritation on the skin. The communities formed a coalition as a way of seeking government intervention in the matter. It was later found out that the Save River, which feeds into Indian Ocean, was now dry as sandbags were being used by the company to divert water from the river for their use (*ibid.*).

Also, in the Marange diamond mining area of Zimbabwe, reports emerged that there had been much air and noise pollution by the diamond mining companies (Mukwa, 2017). Local communities complained that there was no longer peace during the peak of mining operations. Fears of tuberculosis

arose in the communities as there was much air pollution in the area caused by excavation equipment. In March 2012, when the Kimberly Process team visited the area, complaints were also raised by the team that there was much dust that was being caused by caterpillars and graders when roads were being opened and maintained and this endangered the lives of the people living in surrounding spaces (Centre for Natural Resources Management, 2012).

Also, complaints of noise pollution were raised as some companies, including Aijin Investments, operated 24 hours a day with very heavy machinery that made much noise, thereby making the surrounding spaces uncomfortable for the communities. The noise distressed wildlife in addition to the loss of vegetation and drinking water (Centre for Natural Resources Management, 2012).

According to Zimtrade (2006), mining had been key to revamping the economy of Zimbabwe as over the years, it had contributed a fair share of over 4% of the county's Gross Domestic Product (GDP). Efforts have been made to shift and mend the policy frameworks in the country to come up with a better economy, but some companies are still not adhering to what is being imposed, thereby causing lifetime risks to communities.

The view is supported by Ajusa (2013) who advances that focusing on the mining field should not only be on making profits, increasing production and all other economic considerations, but should also go towards sustaining resources through adopting and making use of sustainable production processes. The Government of Zimbabwe had over the previous years been emphasizing on the importance of good business practices to buttress development which had been hampered by poor practices annd were harmful to the environment. The Environmental Data Services Sustainable Business Report (2011) reviews that due to several pressures arising in the twenty first century, businesses are increasingly adopting sustainable management approaches to remain operational by employing people who are well vested with skills and ample knowledge in their areas of specialisation. However, due to economic hardships in recent times of the COVID-19 pandemic, it was very unlikely that organisations would come up with sustainable strategies complying with environmental regulations, thereby creating a research gap. Research has been carried out around sustainable management, but little effort is directed towards determining the impact of business strategies in achieving sustainable operations.

HERETHEORETICAL FRAMEWORK

SUSTAINABLE MANAGEMENT

According to Kramer (2011), sustainable management strategy involves the assimilation of the economic, environmental and social variables in the decision-making and planning of the organisation to create long-term value for the organisations and the society at large. The origins of the concept of sustainable development and management was at the World Commission for Development and Environment in 1987 that took into consideration all technical aspects that would result in possible degradation of the ecosystem, ensuring the enshrinement of individual needs of present and future generations. Mawere (2013) explains the environment as an explicit and active issue denoting the relationship between human groups regardless of culture and biophysical components.

The relationship between the words sustainable, environment and conservation, contribute to formulating the concept on how efficient resources may be used now and in future.

NATURAL RESOURCE BASED VIEW THEORY

Researchers in the line of strategic management have linked organisational success to successful management of internal and external resources. Historically, not much emphasis was placed by the proponents of management theories on how the biophysical environment influences organisational operations (Hart, 2011). The theory was a further development of the Resource Based View Theory on sustainable competitive advantage as driven by resources within the organisation. The thrust of the theory is on attaining sustainable competitive advantage through considering the pros and cons likely to be advanced by an entity's ability to adhere to external environment requirements. The theory focuses on and expresses how the three elements from the external environment are interconnected and related (*ibid.*). The interrelated elements include pollution prevention and monitoring, product stewardship and performance, and sustainable development of the organisation's components. The theory shows how business elements can be integrated and aligned to these elements towards promoting a healthy environment that aids sustainable competitive advantage. Without doubt, since the proposition of the Resource Based View, productive and constructive questions which have led to the development of many other theories have been raised (Conner, 1991). Historical theories focused more on other elements of the

external environment, including the political, social and economic aspect without much emphasis being targeted on the natural environment. The rising number of ecological challenges has rendered some historical theories less important as most of them focus much on the internal business environment overlooking the importance of the external environment.

The external business environment has, in recent years, become a core factor that needs to be considered before decisions are made, passed and implemented. Pollution prevention as one key element of the theory which provides an overview of how important it is for entities to adopt measures and strategies that do not pollute the environment (Winter, 2000). Product stewardship aims at lowering environmental harm by using raw materials that are environmentally friendly which also do not pose harm to communities after use. The two elements of the theory push for sustainable management as environmental sustaining methods would have been well implemented (Hart, 2011).

HYPOTHESES OF THE STUDY AND CONCEPTUAL FRAMEWORK

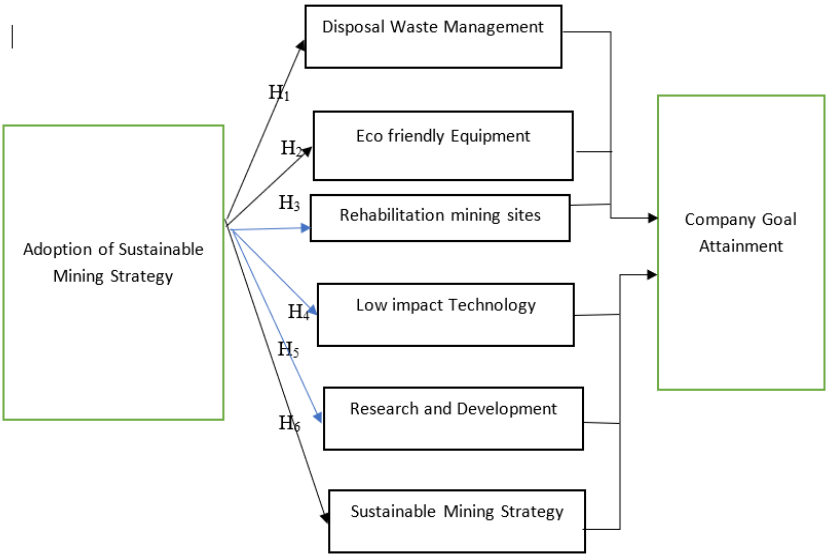

Figure 1: Research Hypothesis *(Constructed by Authors, 2023)*

KEY TO INTERPRETATION

H1. DMW → *CGA Waste Disposal Management positively influences Company Goal Attainment*

H2.EFE → *CGA Eco-friendly Equipment positively influences Company Goal Attainment*

H3.RMS → *CGA Rehabilitation of mining sites positively influences Company Goal Attainment*

H4.LMIT → *CGA Low impact technology positively influences Company Goal Attainment*

H5. RD → *CGA Research and Development positively affects Company Goal Attainment*

H6.SSR → *CGA Sustainable Mining Strategy positively affects Company Goal Attainment*

SUSTAINABLE MANAGEMENT STRATEGY AND COMPANY PERFORMANCE

The Zimbabwean government has set a private-sector-driven economic growth and focused more on coming up with a well-developed economy adjacent to proper management of the environment to achieve sustainability. The International Labour Conference of 2007 pinpointed the importance of an environment conducive towards enterprise management as key to ethical quest for operating profits, promotions of dignity for humanity, ecological sustainability and attainment of company goals (ILO, 2007). The assertion is supported by 17 other elements of sustainable development which revolve around responsible or sustainable stewardship of the environment. An evaluation was carried out in the year 2016 by the Employer's Confederation of Zimbabwe (EMCOZ) to determine the then current state of the country's environment to come up with plans for sustainable development. Through the technical support of the International Labour Conference, core employees and central government representatives, an analysis was done. The assessment carried out by the survey covered all the 17 elements brought forward by the International Labour Conference in 2007 to come up with pertinent solutions (ILO, 2018).

Organisations are continuously becoming inclined to changes in the external business environment not only because of mounting pressure from the policy-makers and customers, but also to have sustainable businesses and exploring profitable gaps that are being left out by others in the industry (Bonini *et al.*., 2006; Bielak *et al.*, 2007). The search for sustainable operating advantage is now an elemental goal for many organisations in the 21st century to achieve long-term success through creation of goodwill. Leadership is deemed the most important factor that helps bring about the aspect of commitment in the workplace and creating an aspect of control (United States Environmental Protection Agency, 2001). Green information technology companies have indicated an improvement in organisational performance due to adoption of environmentally friendly techniques. However, lack of a positive relationship between environmental and organisation performance indicates that entities are still finding it difficult to reap the benefits of environmental sustainability and development.

A change by an entity of the environmental dimensions yields either a positive or negative response to the indicators of organisational performance (GRI, 2011). Proponents of some environmental theories, including the Neoclassic Theory, have highlighted a negative relationship between environmental and organisational performance whilst a study by Porter (1992) shows a positive relationship between the two variables. The underlying assumption of a positive relationship is the adoption of technological means of production which, in turn, increases operational costs at the beginning, but in the long run, improves the financial prospects of the entity. Environmental issues have a significant impact which can be measured on both the performance and its sustainability of an entity. The environment is one area that is greatly legislated from harm by business operations with notable evidence of over 80 000 pages of the European jurisdiction (Williamson *et al.,* 2006) and a great composition of almost 500 European Union Directives from 1997 to date (Ebbage, 2009) and more laws of environmental protection have been seen in the United Kingdom parliament over the years. Williamson *et al. (*2006) opine that there is no notable and decisive evidence which supports the notion that overall company performance is affected by the presence of regulations.

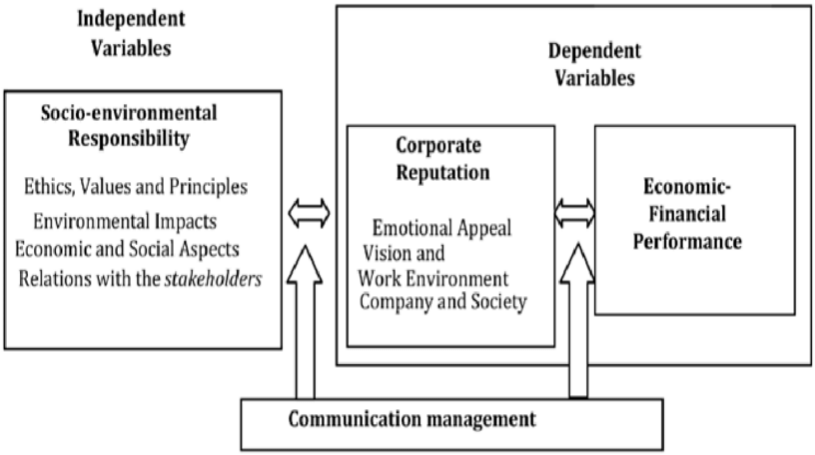

Figure 2: Sustainable management strategy and company performance *(Kruglianskas, 2008)*

Fineman (1996) pinpoints the expected role of leadership in the change process, noting the green practices which should endow in the minds of the employees when commitment is put in them to have an appreciation of what it takes to be a socially responsible entity. Regulations play a role in filling the gap that exists between entities that put their interests ahead of societal needs, thereby creating a huge problem and those that put societal needs ahead of their own. Regulators put in place regulations to protect societies (Williamson *et al.*, 2006) but there is no notable evidence and scholarly view that support the idea of doing away with regulations to enhance business success. Organisations are investing heavily in research and development to achieve long-term sustainable success. Research and development give room for organisations to adopt new means of production that are new in the industry, thereby giving the company an edge over others. Adopting sustainable management provides an organisation an operating advantage over other entities as customers have become particular on purchasing products from those companies which are environmentally friendly. It is perceived that companies which operate with environmental protection in mind, attain higher levels of financial symmetry as compared to those with profit maximisation in mind. Present business operations and success are being defined by the management's ability to adopt strategies

that provide a balance between the economic needs of the organisation, environmental rules of the nation and the social aspect of the community.

The success and effectiveness of a strategy adopted and implemented depends on management quality and expertise, adherence to environmental regulations, ethical considerations, quality of the human capital and overall reputation of the entity. The view is borrowed from the adoption of business practices aimed at creating financial performance, the general public's wealth variable and adherence to social patterns, environmental projected activities, country laws and prescribed regulations (Orlitzky *et al.,* 2003). Sustainable management strategies adopted by entities are all aimed at improving the performance of entities internal controls, decision-making procedures, compliance and reducing costs.

From an organisation's perspective, the aspect of sustainability is made possible only through attaining the company's aims, without compromising stakeholders' expectations and future shareholder values (Dyllick and Hockerts, 2002). Regardless of efforts being made by several entities in coming up with sustainable strategies, the drive for profit maximisation ends up surpassing all other targets of the organisation resulting in strategy diversion. This corporate metaphor can also be attributed to inadequate integration of sustainable management factors and a lack of a defined direction to guide the employees., making it difficult for sustainable management as an objective to be achieved in the present and near future, thereby affecting future shareholder returns.

Delgado-Ceballos *et al. (*2012) opine that for stakeholder expectations to be attained, there is great need to formulate sustainable management strategies which ensure that stakeholder's expectations are met at the end. The whole system is centred on adopting practices that represents a holistic long-term balance between the financial systems of the organisation, ensuring continuous capital injection by investors and, at the same time, implementing policies that ensure which there is no discordance with the ecological environment. Caniels *et al.* (2013) posit that companies are not only aiming to be competitive financially, they are now also aiming to improve their competitiveness environmentally and socially to expand operations. Companies producing and manufacturing in today's business environment should be aware of the effects they are likely to face in the event of overlooking the effects likely to be suffered if environmental and

social issues are not seriously considered. However, it is still to be proven whether making full investment on environmental and social related issues yields positive returns (Lopez *et al.*, 2007).

Several studies show a medium to strong link between economic variables such as investment returns and environmental variables such as pollution (Spicer, 1978). Zhu *et al.* (2013) support the notion and state that for a company to gain competitive advantage over the others in the industry, there is great need to take environmental and social variables into account and improve performance. Hart (1995) uses the Natural Resource Based View to explain the relationship between economic and environmental variable. The assumption of the theory is that companies which operate in an environmentally friendly manner, and fostering strong relationships with the natural ecosystem, achieve sustainable competitive advantage through the notable and proficient use of the non-replaceable resources.

Shrivastava (1995) supports the notion and further articulates that positive relationship between the organisation and the environment can be fostered by adopting technology transfer techniques, quality environmental management and other techniques which, in the end, results in organisational success. Wu and Pagell (2011) and Hofer *et al.* (2012) support the notion that by being environmentally cautious, organisational performance can improve. Adopting environmentally friendly ways results in improved innovation that in the long run, lowers operational costs, resulting in the production of eco-friendly products and improvement in operational means.

RESEARCH METHOD

The study adopts a quantitative research approach. The total population consists of 1 002 employees from various mineral extraction companies in Manicaland Province of Zimbabwe. From the this number, a sample of 278 respondents was calculated using the Raosoft sample size calculator with a 5% margin of error, 95% confidence interval and 50% response distribution. A cross-sectional survey research design was used with stratified random sampling techniques. A total of 278 structured questionnaires were administered, of which 242 were fully completed and deemed usable by the study. This yielded a response rate of 87%.

RESULTS

IMPACT OF SUSTAINABLE STRATEGIES ON COMPANY GOAL ATTAINMENT

To measure the overall company goal attainment, a four-item Likert type question was posed with 'yes' or 'no' as the Likert responses. Goal attainment was measured by social progress, increased productivity, reduction in operational costs and reduction of risk to third parties. The descriptive statistic from this exercise is presented in Table 1 below.

Table 1: Descriptive statistics on goal attainment *(Authors, 2023)*

	N	Minimum	Maximum	Mean	Mean response	Std. Deviation
Environmental balance and social progress	213	1	2	1.03	Yes	.166
Increase productivity and reduce operational costs	213	1	2	1.09	Yes	.292
Improved eco-efficiency	213	1	2	1.15	Yes	.363
Foster compliance with environmental laws and regulations	213	1	2	1.03	Yes	.179
Help in achieving long-term economic growth	213	1	2	1.08	Yes	.272
Eliminate risk posed by mining operations to humans and wildlife	213	1	2	1.10	Yes	.299
Valid N (listwise)	213					

The highest mean in the Table 1 was 1.15 under the descriptor improved eco-efficiency, whilst the highest standard deviation was 0.363 for the same descriptor improved eco-efficiency. The least mean was 1.03 for descriptors environmental balance and social progress and fosters compliance with environmental laws and regulations. In the same vein, the least standard deviation was 0.166 for descriptor environmental balance and social progress. A look at the results shows that both increases in productivity and reduction in operational score had a mean score of 1.09 and 1.15, respectively. This corresponded to 'yes' implying that respondents were agreeable that their companies experienced increased productivity and cost reduction. However, the existence of non-zero standard deviation implied that some could have experienced a decrease in production and an increase in operational costs as is evidenced by a maximum value of 2 on both items. The descriptor improved eco-efficiency had a high mean score of 1.15,

tallying with 'yes'. For the descriptor, a high standard deviation of 0.363 holds that the respondents in the survey held different views.

In this instance, the results were agreeable as shown with a maximum value of 2. Despite the existence of non-zero standard deviations, the overall impression as read from the mean score, is that, generally, mining companies attained their goals, save for a few .

HYPOTHESIS TESTING

To test the hypothesis, the researchers used structural equation modelling (SEM) with AMOS. According to Arkkelin (2014), the structural model can be used to support or refute study hypotheses. The researcher tested the following hypotheses as indicated in the table below.

Table 2: Hypothesis results *(Authors, 2023)*

Hypotheses	Hypothesised Relationship	SRW	CR	P values	Remark
$H1_1$	DMW → CGA	.002	4.284***	.000	Supported
H_{22}	EFE→ CGA	.141	9.108***	.003	Supported
H_3	RMS→ CGA	. 029	5.498***	.004	Supported
H_4	LMIT → CGA	.012	9.125***	.001	Supported
H_5	RD→ CGA	-.213	-11.625***	.000	Supported
H_6	SSR→ CGA	-0.05	-6.684***	.000	Supported
	C	3.22			

Notes: *SRW standardised regression weight, CR critical ratio, ** significant at p < 0.05, *** significant at p < 0.001, ns not significant, Adjusted R square 0.65*

Key to interpretation of hypothesis

H1. DMW → CGA Waste Disposal Management positively influences Company Goal Attainment

H2.EFE→ CGA Eco Friendly Equipment positively influences Company Goal Attainment

H3.RMS→ CGA Rehabilitation of mining sites positively influences Company Goal Attainment

H4.LMIT → CGA Low impact technology positively influences Company Goal Attainment

H5. RD→ CGA Research and Development positively affects Company Goal Attainment

H6.SSR→ CGA Sustainable Mining Strategy positively affects Company Goal Attainment

$$\text{CGA} = 3.22 + 0.001\text{DMW} - 0.213\text{RD} + 0.141\text{EFE} + 0.029\text{RMS} + 0.012\text{LIMT} \quad \text{Equation 2}$$

The model's explanatory power is 65%, as indicated by the modified R square of 0.65. Variation in the sustainable strategies adopted by mining companies accounted for 65% of the variability in company goal attainment, while variables outside the model accounted for 35% of the variation. Of the five sustainable strategies deployed by mining companies, all were found to be statistically significant in explaining variability in goal attainment by mining companies given that all their probability values were less than 0.05 which is the permissible margin of error. A model constant of 3.22 signifies that, assuming that no sustainable strategy is in place, performance of mining companies is assumed to be positive and this is explained by other variables outside this model. Disposal of waste management had a regression coefficient of 0.002, implying that a unit increase in the application of the sustainable strategy would lead to a 0.002-unit improvement in goal attainment by mining companies and the opposite is true, holding other factors constant.

Similarly, use of eco-friendly equipment (EFE) as a strategy is positively related to mining companies goal attainment as reflected by a standardised

regression coefficient of 0.141, meaning that a unit improvement in use of EFE would lead to a massive 0.14-unit improvement in company performance. The same applies to use of low impact technology and rehabilitation of mining site strategy, found to be positively related with the outcome variable as reflected by CRWs. Only investment in research and development was found to be negatively related to company goal attainment as given by the SRW as a unit. Improvement on this strategy was likely to be met by a massive 0.21 deterioration in mining company performance and the opposite is true, assuming all other factors are held constant. A look at the overall effect of the strategies shows that there was a negative relationship between the predictors and the outcome variables as reflected by a regression coefficient of -0.05.

The results can be summarised by a path diagram extracted from AMOS structural equation modelling in Figure 3.

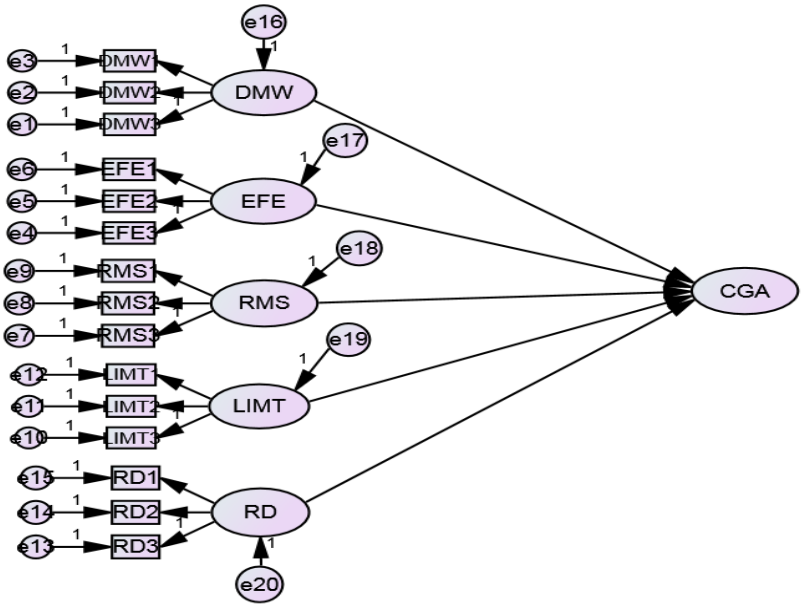

Figure 3: SEM Path *(Authors, 2023)*

The Disposal waste management strategy (DMW) is operationalised into three items, as opposed to the EFE, EFE use strategy, operationalised into four

items with their corresponding residuals. RMS rehabilitation of mine strategy is operationalised into three items, while use of low impact mining technologies strategy was also operationalised into three items, with investment in research and development (RD) having two items. The outcome variable company goal attainment was operationalised into four items.

DISCUSSION

In support of these findings, Laurence (2011) suggests a sustainable mine is one that is safe, demonstrates leading practice in environmental management and community engagement, is economically robust and that, importantly, efficiently uses the mineral resource. If this is done well, the mine life will be optimised, the community benefits maximised and the industry itself will have wider community acceptance. Similarly, Gorman and Dzombak (2018) posit that strategies for assessing the sustainability of mining operations include measuring, monitoring and working to improve various environmental performance metrics and these are used to determine whether a mining operation is sustainable.

As such Gorman and Dzombak (*ibid.*) allude that the key metrics for environmental sustainability in mining relate to efficiencies in resource consumption, minimising land disturbance, pollution reduction and closure and reclamation of exhausted mining lands.

CONCLUSION, IMPLICATION, SUGGESTIONS AND LIMITATIONS

The study concludes that there is a strong positive relationship between sustainable management strategies and company performance. Sustainable management strategies consider both the internal and external environment before decisions are passed. The success and effectiveness of a strategy adopted and implemented depends on management quality and expertise, adherence to environmental regulations, ethical considerations, quality of the human capital and overall reputation of the entity. The main objective of the study was to determine the effect of adopting sustainable management strategies in complying with environmental regulations towards the attainment of corporate goals. The study findings show that there is a positive relationship between strategy choice and environmental performance. Strategy choice is directly linked to company performance, hence the right strategy should be put in place. Companies in the mining sector are profit-oriented, hence their strategies are aligned only to the profit

motive at the expense of environmental performance. Strategies by mining companies are aimed at improving the prospects of shareholders, hence they overlook the importance of incorporating the environmental variable in decision-making. To improve environmental performance in mining communities, the study makes the following recommendations.

The study recommends the alignment of company strategies with both the internal and external environment since they both influence the future position of the business. It is the strategy of a company that helps in shaping the whole company towards moving a certain direction. Businesses do not operate in isolation. There are many factors which companies should take into account before final decisions are made and passed. Also, company strategies should not be formulated without consulting both internal and external stakeholders. Linking value creation and shareholder value legitimises actions within the notable context for traditional businesses outlining performance indicators to wider stakeholders and how advantageous it is to the long-term success of an entity (Potter and Krammer, 2010). The whole business environment is an explicit and active parameter denoting the relationship between human groups and other biophysical components (Mawere, 2013). The relationship between variables linked to sustainable management and environmental conservation should be considered when formulating successful company strategies. The study recommends strong checks by responsible government departments on company operations and environmental performance. Regulatory departments are put in place to achieve government objectives by making sure that regulations, laws and other measures put in place come with better socioeconomic indicators, hence improving the quality of life and the overall business environment (Birkland, 2015). To safeguard the environment, the regulations in place should be thoroughly enforced and perpetrators accounted for to promote a culture of sustainability and conservancy. The strictness in enforcing laws is the one that determines the sanity of the natural environment. Also, the study recommends the use of a strong independent board to check whether the government is making enough effort to enforce the set regulations. The appointment of an independent board could help in pushing government departments to make efforts in exercising their duties (Mudimu, 2015). Complacency and corruption by government departments are the key variables that have led to environmental decay. Setting up a strong board could help in eliminating the unwanted effects posed by mining companies.

In view of this, similar research could be carried out in other mining provinces of Zimbabwe and other sectors as the this study focused on mining companies only in Manicaland Province. The findings of the research cannot be generalised, unless similar findings have been obtained. Similar research could be carried out in the manufacturing sector as the sector is a threat to environmental performance.

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