

ENVIRONMENTAL CONSCIOUSNESS AS A FACTOR WHICH PROMOTES FIRM GREEN INVESTMENT PRACTICES IN JOHANNESBURG STOCK EXCHANGE (JSE) LISTED FIRMS

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Abstract

Heightening consciousness concerning natural environmental issues has also resulted in high pressure on firms to introduce green friendly programs. This study explored the relationship between environmental consciousness and green investment practices in 100 South African CDP firms on the JSE over a period of 5 years (that is, 2010 to 2014). The paper analysed the data using Chi-square tests and the results demonstrates that environmental consciousness influences green investment activities in JSE listed companies. Furthermore, a positive direct relationship involving environmental consciousness and green investment activities was ascertained. The paper also produced common and major indicators of environmental consciousness for the firms under study. A brief discussion on corporate views from selected JSE listed firms in relation with environmental consciousness was also implemented.

Keywords: Environmental Consciousness; Green Investment Practices; JSE Listed Firms; South Africa; Carbon Disclosure Project (CDP)

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1 Introduction

Most governments have heightened their attention towards natural environment interests (Belin et al., 2011). Such high prioritisation has generated increasing pressure on corporations to integrate environmental perspective in business strategy and operations (Aasen, 2010). Therefore, the impact of such environmental movements has also affected the operation of companies in developing countries though the issues on sustainability are relatively new in these nations (Creamer, 2011). It has been determined that environmental issues in developing economies has been constrained and marginalised as priority is given to other challenges (such as poverty alleviation, housing, education and health), absence of environmental preservation funding plus lack of appropriate legal and administrative frameworks to devise and manage adoption of environmental laws (Dane, 2014). Nonetheless, since environmental awareness has increased among governments, the impact of corporations on the natural environment has also become an issue that most stakeholders are concerned about in recent years (Chang, 2011). It follows that such environmental concern has not only been supported by environmental law enforcement (government initiative) and environmental interest groups, but other stakeholders such as employees,

suppliers, indigenous communities, consumers and financial entities have also added their voice (Innes and Sam, 2008). In such a manner, there has been heightening demand for companies to develop better green policies and environmental management standards plus activities (Eyraud et al., 2011). Therefore, one essential condition which supports better corporate environmental management initiative includes the availability of efficient environmental consciousness in all levels of the company, with the mechanisms plus understanding essential to support pro-environmental behaviour and instituting environmental responsible decisions within the corporate contexts (Santolaria et al., 2011; Johnstone and Labonne, 2009). On that account, this study will explore if environmental consciousness influences corporate green investment practices in JSE listed companies.

Hence, the principal research question which supports this research is: Do environmental consciousness influence corporate green investment practices in JSE listed companies? The objective of this study is, therefore, to investigate if environmental consciousness contributes towards improved corporate green investment practices in JSE listed firms. As such, this study is significant in this globalisation era plus liberation of global trade activity as companies require to prepare for new business demands where

markets structure performance is also affected by natural environmental principles (Chang, 2011). In this regard, lag in incorporation of environmental management models by companies can be a constraint to effectual firm performance (Perron et al., 2006). This view is founded upon the fact that environmental consciousness has become a global topical issue; hence it is an important issue for the long-term perspective of the planet. Hence, environmental consciousness is important since companies need to understand how their practices affect the natural environment (Banerjee et al., 2002). In this respect, companies need to comprehend what affects their business strategy and activity on this planet and then develop mechanisms which protect the natural environment (Min, 2011).

2 Conceptual model

This section outlines a brief evaluation on the concept of corporate green investment practices. Then, a detailed analysis on the concept on environmental consciousness is also implemented.

2.1 Corporate green investment practices

The growth of corporate green investment initiatives has been determined to be increasing in global corporate settings (Inderst et al., 2012). Hence, Phung (2014:1) outlines that “Green investments are traditional investment vehicles (such as stocks, exchange-traded funds and mutual funds) in which the underlying business (es) are somehow involved in operations aimed at improving the environment. This can range from companies that are developing alternative energy technology to companies that have the best environmental practices.” World Economic Forum (2013:12) defines green investments as “a broad term closely related to other investment approaches such as socially responsible investing (SRI) and sustainable, long-term investing.” Then, Farlex Financial Dictionary (2014:1) define green investments as “Any investment that involves taking a position in securities exclusively in environmentally-friendly companies. Different green investments involve different methodologies for determining what constitutes an environmentally-friendly company. Some may avoid certain industries, such as oil and gas, entirely, while others may look at the environmental records of particular companies.” Comparatively, corporate green investment practices are low-carbon plus climate friendly investments which concur with environmental preservation mechanisms (Inderst et al., 2012). Eyraud et al., (2011:7) explains that firm green investment initiatives includes “(i) financial investment in renewable technologies (including large hydroelectric projects), (ii) capacity investment in the nuclear sector, (iii) selected energy-efficient technologies, and (iv) research and development (R&D) in green technologies.” Accordingly, numerous green

investment practices within corporate contexts have been identified.

For instance, Wong (2012) surveyed 134 Chinese manufacturing exporting firms and posits that these entities incorporated green logistics management (GLM) in the organisation’s value chain. Dou et al., (2014) assessed a pivot irrigation company in Northwest China and express that the firm incorporated a “green supplier development program” designed to improve green performance of the firm’s suppliers who were identified to be more than 50. Yen and Yen (2012) conducted a research on 863 Taiwanese high-tech electronic companies and points out that they institute green purchasing benchmarks. Zhang et al., (2011) implemented an analysis on 4 national commercial banks, 4 joint-stock commercial banks and 2 financial banks in China and finds out that these financial institutions have a green credit facility for companies that require to improve their corporate environmental performance. Lin et al.,(2013) surveyed four major international motorcycle companies in Vietnam and demonstrates that these firms incorporated green product innovation (preventing waste increase in product disposal, efficient use of resources and minimising undesirable environmental risks and impacts in firm operations). Aasen et al., (2010) studied 18 Norwegian companies and illustrates that these enterprises instituted “electricity disclosure schemes” which have motivated them to expand green energy integration as the electricity reporting procedure is designed to inform consumers about sustainable energy adoption, prevention of radioactive waste production and reducing carbon emissions.

2.2 Environmental consciousness

Environmental consciousness also termed environmental awareness is an approach in which company managers and employees are able to understand the significance of environmental issues that the organisation experience (Banerjee et al., 2002; Min, 2011; Perron et al., 2006). Zelezny and Schultz (2000) defined environmental consciousness as a constituent of belief frameworks that are promoted by specific individuals so as to foster pro-environmental conducts. In the same vein, it refers to diverse forms of corporate pro-environmental conducts that are determined by various composite explanatory factors, namely environmental activism (affiliation with environmental interest groups, environmental co-operative networking, environmental protests), individual low-costs conducts (waste management, cleaner production) (Wu et al., 2011) plus individual high-costs conducts (green consumerism) (Mostafa, 2009). Hence, environmental consciousness is an environmental engineering philosophy which considers environmental issues (from the production phase to its disposal stage) of a company’s manufacturing design or the firm’s product life cycle into account (Shin et al., 2008). Wimmer (1992)

expressed environmental consciousness as a sophisticated model about norms and behaviours that are also essential components of social consciousness. From a social perspective, environmental consciousness is important for business entities through describing the extent to which the firm is able to manufacture commodities that reduce the natural environment damage.

3 Related literature

Previous global studies have ascertained a relationship involving environmental consciousness and corporate green investment practices. For instance, Chang (2011) explored the impact of green innovation ethics on firm competitiveness in 106 Taiwanese manufacturing companies. The study identifies that suppliers environmental needs increase the company's environmental awareness which enable the company to increase environmental investments leading to superior green advancement. Innes and Sam (2008) investigated the 33/50 program designed by Environmental Protection Agency (EPA) in the US, a green voluntary initiative which focused on pollution reduction. They express that if corporate manufacturing practices heighten pollution levels, these firms will begin to integrate expanded environmentally conscious practices since environmentally aware consumers can substitute non-green commodities with other acceptable green products. Santolaria et al.,(2011) examined how eco-design policies are related to innovation by studying 846 Spanish companies which are part of Infonomia (Spain's biggest innovation group). The results indicate that eco-design policies are perceived as paramount stimulators of green innovation. Johnstone and Labonne (2009) examined 4000 facilities located in 7 OECD countries (Canada, France, Germany, Hungary, Japan, Norway, United States) on why manufacturing firms incorporate environmental activities. The findings suggest that environmental standards such as ISO 14001 certification generate positive environmental awareness that results in ISO certified firms introducing numerous and diverse environmental management mechanisms.

Zutshi and Sohal (2003) explored stakeholder participation in corporate environmental policy integration by surveying 9 managers from manufacturing and service companies in Australia. The authors introduce that lack of environmental awareness propelled by employee declination to be involved with the firm's environmental programs inevitably result in delay and failure of corporate environmental initiatives. Perron et al.,(2006) investigated on how to improve environmental consciousness at organisational level by surveying 30 individuals from two Canadian electrical companies. The outcomes argue that the organisations environmental conduct is influenced through diversified environmental motivators that include environmental information, environmental

consciousness and environmental concern. Brown (1996) examined green policy in hotels by interviewing 33 hotels managers (with environmental strategy) and 54 hotel managers (with no environmental strategy) in the UK. The results evidences that that companies with environmental strategy had high environmental consciousness (among employees, practices, shareholders) supported by better environmental performance when compared with companies with no environmental strategy. Stabler and Goodall (1997) explored environmental consciousness, practices and performance by analysing 301 hotels in Guernsey (with a 45% response rate). The outcomes reports that environmental consciousness was evidenced in these hotels attitudes, policies and practices which motivated these hotels to introduce extended environmental activities which results in reduced costs and/or increased financial benefits. Chan et al., (2014) surveyed 438 hotel workers from Hong Kong on the motivators of employee green initiative. The outcomes suggested that "environmental awareness", "environmental knowledge" and "environmental concern" were positively related with goals to institute green activities in these enterprises.

However, some global researches have not found an association involving environmental consciousness and green investment practices. For example, Aragón-Correa and Rubio-López (2007) implemented a study on 140 firms in the UK and French food sector concerning proactive firm environmental policies. The outcomes highlights that environmental benchmarks such as ISO 14001 certification will not result in sound environmental consciousness and hence, environmental accomplishments when implemented alone (as some companies may use it as a marketing label). Tilley (2000) investigated corporate environmental ethics by using small companies in Leeds, England and suggest that environmental conducts by firms rarely transform into sound environmental practices. Thus, environmental consciousness had a negative correlation with firm environmental practices. Harris and Crane (2002) assessed green culture development within a corporate situation by surveying 37 managers (senior (17), middle (12), junior (8)) from industrial and service companies. The results indicate that though these managers companies were environmentally conscious, few companies have adopted green initiatives that that meet expectations of environmental activists and standards.

Gadenne et al., (2009) explored environmental consciousness and initiatives by investigating 166 small and medium companies in Queensland, Australia. The research founds out that the managers have green attitudes and knowledge as a result of environmental legislation pressures but have not translated that green awareness into practice by introducing sound environmental activities and environmental technologies. Belin et al.,(2011) undertook a research on the drivers and particularities

of eco-innovations in German and French industries. The results convey that green consciousness related with eco-innovation in French firms has not promoted its associated green Research and Development (R&D). Thus, a negative relationship involving eco-innovation and green R&D was noticeable in French companies but the outcome was not significant in Germany contexts. Borghesi et al.,(2012) analysed the factors which promoted integration of eco-innovations by surveying Italian industries from 2006 to 2008 and discovers a negative association involving eco-innovation companies and connected green Research and Development (R&D). Darnall et al.,(2005) internationally compared drivers influencing corporate environmental policy and performance by analysing 4176 firms from the US, Norway, Canada and Germany. They identified few and little variances involving environmentally certified firms and environmentally non-certified firms. Iraldo et al.,(2009) explored the adoption of eco-management and audit scheme (EMAS) in Europe by analysing companies (70 EMAS adopters and 31 EMAS non-adopters) and observes that voluntary environmental certification practices are characterised by a reduced degree of environmental “maturity” in many companies. Therefore, environmental consciousness does not determine corporate environmental practices.

Bönte and Dienes (2013) examined environmental innovations in 15 manufacturing firms of 14 European nations from 2002 to 2004 and were unable to discover a positive association involving environmental “co-operation strategy” and environmental advancement performance. Okereke and Russel (2010) explored carbon management activities of United Kingdom energy intensive firms (Centrica, Royal-Dutch Shell, Scottish power, Corus, British petroleum, BHP-Billiton). The outcomes express that despite heightening green consciousness about the possible strategic value of carbon-intensive mechanisms; the firms have done little to imply that climate change has motivated pro-environmental revolutionary change in enterprise operations.

4 Theoretical framework: stakeholder theory

Freeman defined stakeholders as “any group or individual than can affect or be affected by the realisation of a company’s objectives” (Freeman, 1984:46). Clarke and Clegg, (1998); and Haigh and Griffiths (2007) identify corporate stakeholder groups as including amongst others: customers, suppliers, shareholders, the local community, the media, government, employees and the natural environment. The natural environment is perceived as the firm stakeholder since it is the habitat for all living and non-living components which maintains company practices (Haigh and Griffiths, 2007). In this regard, all materials that corporations require generate from the natural environment (Santolaria et al., 2011). Hence, the natural environmental can be viewed as

one which is comprised with both political and economic power and utterances which humans should be able to hear and understand so as to be appreciative (Innes and Sam, 2008). In this case structures and particular individuals who represent the natural environment in corporate decision-making processes should be formally appointed and set-up within corporate contexts since the natural environment on its own is unable to sit in any consultative discussion and meeting (Yen and Yen,2012).Some school of thought have also added absence of mutual interaction, lack of coercive influence and inability of natural environment to impose power in traditional “economic exchange” since it cannot bargain and lacks control (Haigh and Griffiths, 2007). In this regard, it is important that corporations are bounded through legitimacy which do not only focus on economic views but there should be adequate attention and emphasis assigned to natural environment requirements (Chang, 2011).

5 Research methodology and data analysis

This research employed data acquired from company’s sustainability reports and/or yearly integrated reports over a period of 5 years (that is, 2010 to 2014). This research was a multiple case study which considered the entire 100 South African Carbon Disclosure Project (CDP) firms which are on the JSE. The content analysis technique was utilised to retrieve information that demonstrate environmental consciousness as a factor which spur firm green investment initiative in JSE listed companies. In this research, the researcher generated a list of phrases which points out to environmental consciousness as a variable that promotes company green investment programs. Therefore, the deployment of categorical themes in business sustainability issues have been found in diversified environmental sustainability literature (Gray et al., 1995; Hackston and Milne, 1996). The researcher closely examined paragraphs and more specifically sentences that have a relationship with the variable-environmental consciousness from the reports and extracted them. In this case, if the company indicates that environmental consciousness does stimulate their green investment activity, the number of those confirmations were collected in the “Indicator” row, while non-confirmations were collected in the “No Indicator” row. In this regard, collected textual data was simultaneously transformed into numerical formats. Then, the numerical data was evaluated by employing Chi-square tests.

5.1 Data Analysis

This section presents an analysis of the quantitative and qualitative data analysis component of the study. The computations of the IBM SPSS Version 22 generated the Chi-square tests findings as presented in Table 2 and Table 3 below:

Table 1. Results regarding JSE listed companies indicating the extent that environmental consciousness promote green investment practices

		Green investment practices		TOTAL
		Practicing	Not Practicing	
Environmental consciousness	Indicator	333	167	500
	No Indicator	167	333	500
TOTAL		500	500	1000

Table 2. Showing the relationship between environmental consciousness and green investment practices in JSE listed firms: Chi-Square tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	110.224 ^a	1	.000	.000	.000
Continuity Correction ^b	108.900	1	.000		
Likelihood Ratio	112.344	1	.000		
Fisher's Exact Test					
Linear-by-Linear Association	110.114	1	.000		
N of Valid Cases	1000				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 250.00.

b. Computed only for a 2x2 table

5.2 Rejection and acceptance of hypotheses

Given the level of significance, $\alpha = 0.05$ (5% significance level)

The *degrees of freedom* formula is: $df = (r-1)(c-1)$, where r = the number of rows in the cross-tabulation table and c = the number of columns in the cross-tabulation table.

In this example, $df = (r-1)(c-1) = (2-1)(2-1) = 1$.

Then the X^2 -critical value will be determined using $df = 1$ and $\alpha = 5\%$ or 0.05. The region for acceptance for H_0 is $X^2\text{-Stat} \leq X^2\text{-critical value}$.

X^2 -critical value with $df = 1$ and $\alpha = 5\%$ or 0.05 is 3.843. The X^2 -statistic value was determined as 110.224 as indicated in Table 2 above. The X^2 -statistic value is the Pearson Chi-Square value. Therefore, the decision was that we reject H_0 and accept H_1 since $X^2\text{-Stat}$ (110.224) is greater than X^2 -critical value (3.843). Thus, environmental consciousness influence green investment practices in JSE listed firms.

Table 3. Results on the correlation between environmental consciousness and green investment practices in JSE listed firms

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Phi	.332	.000
	Cramer's V	.332	.000
N of Valid Cases		1000	

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Since the study findings demonstrated that environmental consciousness influence green investment practices in JSE listed firms, the Phi and Cramer's V were two tests adopted to analyse the strength of the relationship involving environmental consciousness and green investment practices in JSE listed firms. The findings presented in Table 3 above indicate that the strength of association was ascertained to be 0.332. As such, the results indicate a positive linear relationship between environmental consciousness and green investment practices in JSE listed firms.

6 Discussion of the findings

The Chi-square tests demonstrates that environmental consciousness influence green investment practices in JSE listed firms. To strengthen these results, Phi and Cramer's V tests were adopted to test the strength of the association between environmental consciousness and green investment practices in JSE listed firms. The results indicates that the strength of the relationship was established to be 0.332 thereby implying a positive direct relationship between environmental consciousness and green investment practices in JSE listed firms. As such various reasons

could be suggested to describe the context of these study outcomes. For example, Van den Berg et al., (2013) illustrates that green innovation awareness has continued to drive integration of green development practices in 75 investigated South African firms. CDP (2012) argues that the Carbon Disclosure Project (CDP) in South Africa has improved knowledge about carbon emissions hence most companies are broadening their green investment activities and engagement. Creamer (2011) documents that firms which have knowledge and awareness on green energy technologies and low carbon fuel alternatives are likely to benefit from the introduction of Carbon Tax (in January 2015) in South Africa. Therefore, these findings could explain why environmental consciousness influenced green investment practices in JSE listed firms.

In addition, other South African contexts spotlights that environmental consciousness, improve through carbon management practices which promotes integration of green technologies (Tyler et al., 2009a), improve corporate environmental participation (Tshautshau,2013), support business activities to do away with non-green traditional practices of operating their enterprises (Witi,2008), motivates Greenfield investments and Brownfield investments (Dane,2014), and empower South African companies to manage climate change risks through broadened integration of green programs (CDP,2014). Hence, an exposure of these reasons could therefore substantiate the study

results, that environmental consciousness influence green investment practices in JSE listed firms. This study outcome has also been supported by diversified international level findings. For example, researches by Chang (2011); Innes and Sam (2008); Santolaria et al.,(2011); Johnstone and Labonne (2009) and Perron et al.,(2006). Nevertheless, study findings by Aragón-Correa and Rubio-López (2007); Tilley (2000); Gadenne et al., (2009); Belin et al.,(2011); Green et al.,(1994); Borghesi et al.,(2012); Darnall et al.,(2005); Iraldo et al.,(2009) plus Bönnte and Dienes (2013) demonstrate that environmental consciousness does influence corporate green investment practices. Hence, they are not in agreement with the study results. The next section presents the stimulators of environmental consciousness as a factor which promotes green investment activities in JSE listed companies.

6.1 Indicators of environmental consciousness as a factor that promote corporate green investment initiatives in JSE listed companies

The following Table 4 indicates common indicators of environmental consciousness as a variable which supports corporate green investment initiatives in JSE listed companies over the studied 5 year period (that is, 2010 to 2014).

Table 4. Indicators of environmental consciousness as a factor which promote corporate green investment practices in JSE listed companies as studied from 2010 to 2014

Summarised indicators of environmental consciousness	Number of companies which supported the indicators				
	2010	2011	2012	2013	2014
Carbon management adaptation approaches are incorporated in firm policy and operations.	2	2	1	2	2
Companies have developed a climate change strategy for the long-term.	2	2	3	4	4
Support environmental transformation which results in overall green lifestyle and green behaviour in the firm.	1	1	1	1	2
Works with government, media and academia in promoting climate change awareness programs.	1	1	2	3	4
Integrates latest energy efficiency technologies.	1	3	4	3	4
Risks linked with climate change are reduced by sound environmental control measures adopted.	2	1	1	1	2
Low-carbon investment issues build meaning, interaction and exchange of knowledge with external partners.	1	1	1	2	1
Utilise the Greenhouse Gas Accounting Protocol and the ISO14064 International Standard for GHG Emissions Inventories and Verification	2	1	1	1	1
Participate with other industrial associations on carbon matters which generates new green ideas and strategies.	1	1	1	2	1
Undertakes research & development on carbon emissions related issues.	2	2	3	3	5

Table 4. Indicators of environmental consciousness as a factor which promote corporate green investment practices in JSE listed companies as studied from 2010 to 2014 (continued)

Summarised indicators of environmental consciousness	Number of companies which supported the indicators				
	2010	2011	2012	2013	2014
Carbon emissions are lessened in accordance to identified and prescribed environmental baselines.	1	2	2	2	3
Continually refurbishes environmental assets so as to conserve energy usage.	1	1	1	2	1
Have incorporated environmental and carbon footprint accounting models.	1	2	1	1	2
Monitor carbon emissions of its upstream and downstream partners.	1	1	1	1	1
Installed green appliances regularly check energy usage and environmental impacts.	2	2	3	3	4
Engages environmental and climate change experts and specialists in firm operational environmental management policies and practices.	2	1	2	2	3
Is improving the capacity of environmentally sound technologies.	1	1	1	1	1
Stimulated towards improving the firm's carbon emissions reduction data targets.	2	1	1	2	1
Continually updates and revise environmental policies.	2	2	1	1	2
Invest in renewable or green energy projects.	1	2	3	2	4
Undertakes energy audits so as to standardise and improve energy consumption.	1	2	2	2	2
Incorporates co-generation of green energy schemes which eventually will fully substitute fossil fuel use in the future.	1	1	1	1	1
Differentiation of green products attracts various outside participants.	1	1	1	1	2
Environmental managers are expected to train and educate internal and external partners on green matters.	2	2	4	3	4
Buildings are regularly upgraded and refurbished using green attributes.	1	1	1	2	1
Adopting best practice green technology.	1	1	1	1	1
Infrastructure sharing minimise climate change related challenges.	2	2	1	1	1
Corporate procurement team influence suppliers to adopt green policies.	2	2	3	3	3
Climate change policy is expanded in the supply chain.	1	1	1	1	1
Expanded use of green energy and green technologies.	2	2	1	1	1
Green facilities are upgraded and refurbished to accurately measure green metrics.	2	1	1	1	2
Support public involvement in environmental issues.	1	2	2	4	3
Integrates green energy and low carbon packaging processes and methods.	2	1	1	1	1
Energy efficiency measures are promoted.	1	1	1	2	2
Regular employment of environmental offsets.	1	1	1	2	1
Screen suppliers using green benchmarks.	1	2	1	1	1
Committed towards minimising environmental footprint.	2	2	1	1	1
Utilise an efficient environmental policy and energy mix.	1	1	1	1	2
Supports effective environmental management of value chain practices and efficiencies.	1	1	1	2	1
Promote virtual data centre establishment which reduces carbon footprint.	1	1	2	1	1
Textile products are designed in mechanisms that save energy.	1	1	1	1	2

In relation to the explored JSE listed companies, Table 4 above managed to outline the major indicators of environmental consciousness which were noticeable for the considered period of study (2010 to 2014). On that account, these indicators are, namely, integrating the latest energy efficiency technologies; undertaking research and development in carbon emissions related issues; environmental education and training; installing appliances which regularly check energy usage and environmental impacts, and investing in renewable energy and projects. In addition, more environmental awareness indicators are that the firms are, working all stakeholders in supporting climate change consciousness programs; green appliances are incorporated to regularly monitor energy plus environmental effects; firms are integrating the latest energy efficient technologies; companies have adopted long-term climate change strategies in firm policy and firm procurement teams influence suppliers to adopt green policies. Therefore, the indicators of environmental consciousness in JSE listed firms as outlined in Table 4 demonstrate that increased environmental awareness within corporate contexts is important to promote extended incorporation of corporate green investment initiatives. As observed from the indicators of environmental consciousness (see Table 4), it can be determined that environmental awareness, affects all the business operations value chain, plus stakeholder environmental consciousness has the ability to put pressure on the company to improve its performance by instituting green investment activities. An analysis of corporate perceptions in relation to environmental consciousness demonstrates that the JSE listed firms support acquisition of higher environmental awareness in order to conduct their business operations ethically. In this case, JSE listed companies have been challenged to develop creative green innovative mechanisms so that they are able to meet growing environmental business plus environmental regulatory procedures.

6.2 Corporate perceptions on environmental consciousness as a factor which stimulates green investment practices in JSE listed companies

This section presents company view regarding environmental consciousness. These perceptions were directly extracted from selected JSE listed companies using simple random sampling techniques as all the firms under study were assumed to be incorporating green programs in their business operations. Only 10 corporate views were selected and analysed in this study. The study considered corporate perceptions of year 2012 since 2012 is a middle year over the examined 5 years (2010 to 2014), hence it enhances a more detailed examination of the firm's green investment stance with regard to the previous 2 years

(2010 plus 2011) and the following 2 years (2013 and 2014) about the variables under study.

Investec (2012:2) *“Investec recognises that effective environmental management is an essential part of our embedding front-of-mind consciousness of sustainability into the organisation.”*

The above statements conform to the perception that environmental consciousness motivates corporate green initiative. In this case, the JSE firm identify environmental awareness as an important instrument which spur corporate environmental engagement.

Sasol Ltd (2012:18) *“Through Sasol’s participation in various events, we were able to build awareness of the issues we face in responding to climate change challenges. We showcased the role of gas as a bridge to a lower-carbon economy, our clean coal technologies, and energy efficiency improvements.”*

The practices being adopted by the firm towards lowering carbon footprints in products indicates the strength of high environmental consciousness. The company understands the processes, methods and standards which are important to spur improved environmental performance. Therefore, the statement seems to point out that environmental consciousness increased firm engagement with greener technologies.

African Rainbow Minerals (2012:106) *“A climate change strategy, policy and awareness training project was initiated in 2011. This project is progressing well and includes a carbon management strategy and emissions reduction plan.”*

The statement by African Rainbow Minerals proves the significance of environmental consciousness in business operation activities. It demonstrates that persistent examination of corporate environmental effects enhances the firm to acquire greater knowledge and consciousness on the best green mechanisms and procedures that the company can integrate to protect natural environments.

Pioneer Foods (2012:67) *“An IT solution to accommodate the Groups sustainability reporting needs is being investigated. More emphasis will be placed on employee education and awareness in terms of environmental management at all levels.”*

The above statement by Pioneer Foods spotlights that it is improved corporate environmental awareness that enhance the firm to gain green knowledge in addition to instituting green technologies in order to support natural environment preservation.

Pretoria Portland Cement Co Ltd (2012:37) *“Revise green procurement policy and strategy. Improve supplier awareness through third-party programme.”*

From the statement above, green initiative incorporation builds environmental knowledge and consciousness thereby enabling the company to develop relationships with other stakeholders whom they then influence to support green interest and practice embedment in their company policy. Hence,

partnering with such actors assists the firm to develop well-established and broadened green practices.

Northam Platinum Ltd (2012:133) *“The trust was established as a conservancy trust by Northam Platinum Limited, with the principal objective of engaging in the conservation, rehabilitation and/or protection of the natural environment, including flora, fauna and biosphere as well as promoting the establishment of, and education and training programmes relating to, environmental awareness, greening cleanup and/or sustainable development projects in respect of Portion of the Farm Buttonshope 51, Registration Division JT, Mpumalanga Province, and which may involve the participation local communities.”*

The company highlighted the importance of environmental awareness and knowledge in spurring effective responsible environmental management practices of the company.

Kumba Iron Ore Ltd (2012: 70) *“The mine-based environmental managers are charged with creating awareness amongst employees and are supported both by internal and external environmental technical experts. The environmental manager, who reports to the executive head: safety and sustainable development, takes responsibility for all environmental issues.”*

The above statement also noted the importance of environmental awareness in corporate environmental practices. In this case, environmental awareness generation is an important issue that firm environmental managers are expected to support and uphold with assistance of other experts. Thus, this perception is in line with the quantitative result which explained that environmental consciousness influence company green investment activities.

Royal Bafokeng Platinum Ltd (2012:96) *“Emphasis was also placed on employee behavioural change. In conjunction with Eskom we launched an energy awareness campaign in July 2013. Subsequently energy management was introduced as part of our employees’ mine induction and ex-leave programme.”*

This statement illustrates that once companies are environmentally aware, they are empowered to introduce green practices which preserve the natural environment through effective energy management practices.

Old Mutual Plc (2012:31) *“Raising our employees’ environmental awareness helps us to reduce our environmental impacts. We encourage employees to become environmental champions and have a positive influence on the actions of the wider stakeholder community.”*

The statement by Old Mutual informs that employees can become environmental champions only when their environmental consciousness has been determined to be high and positive. Moreover, companies are able to minimise negative environmental externalities if they are

environmentally aware. As such, environmental awareness also empowers the firm to have favourable environmental impacts on their stakeholder behaviours.

Aveng Group Ltd (2012:54) *“Given the diverse range of businesses within the group, it is also important that the methodology is able to draw distinct lines of responsibility for carbon emissions and other environmental indicators within the construction/building value chain. The reporting and operational boundary challenges are being addressed through more training and awareness.”*

Aveng Group Ltd describes that when firm environmental impacts are considered in firm policy; heightened environmental consciousness is significant towards developing effective green investment mechanisms which address identified environmental challenges.

7 Overall discussion and conclusion

Environmental consciousness is one of the major factors which influence green investment practices in JSE listed companies. The strength of this relationship between environmental consciousness and green investment practices for JSE listed companies was ascertained to be 0.332 thereby indicating a positive direct relationship. As observed from the drivers of environmental consciousness, it can be determined that environmental awareness, affects all the business operations value chain, plus stakeholder environmental consciousness has the ability to put pressure on the company to improve its performance by instituting green investment activities. An analysis of corporate perceptions in relation to environmental consciousness demonstrates that the JSE listed firms support acquisition of higher environmental awareness in order to conduct their business operations ethically. In this case, JSE listed companies have been challenged to develop creative green innovative mechanisms so that they are able to meet growing environmental business plus environmental regulatory procedures. Therefore, companies which seek to adopt environmental sustainable approaches are expected to heighten environmental awareness of their practices, internal and external partners. Thus, lack of environmental consciousness inevitably jeopardise green investment initiative of the company thereby restraining the company to acquire connected social plus economic benefits. Therefore, the adoption of green investment initiatives demands that values plus culture of the firm require to permeate the company’s practices and adopted by both managers and employees. These frameworks and transformations in culture need efficient and consistent environmental consciousness practices which insure that green information essential for this procedure is obtained and retained so that advantages associated with greening can be realised. Since environmental consciousness continually develops with time,

companies which plan and integrate green programs are also expected to assess such interventions in order to understand the results and success. In this regard, the company should provide adequate funds, sufficient time and effectual green research and development (R&D) processes.

7.1 Conclusion

As result of different mega-developments which include global pressure concerning environmental damage and various tough environmental legislations over company operations, corporations today are under heightening overpowering pressure to act in an environmentally conscious approach. As such, this study conducted an investigation on 100 South African CDP companies on the JSE by exploring the relationship between environmental consciousness and green investment activities over the studied 5 year period (2010 to 2014). Hence, using the Chi-square tests the findings demonstrates that environmental consciousness influences green investment activities in JSE listed companies. In addition, a positive direct relationship involving environmental consciousness and green investment activities was ascertained (0.332). This study also drew out common and major indicators of environmental consciousness in relation to JSE listed firms. Corporate perceptions regarding environmental consciousness extracted from the firms sustainability and/or yearly integrated reports were also discussed in detail. Future research should, therefore focus on exploring the association involving company operations and its green policy plus the procedure of incorporating and adaptation of such approaches to achieve sustainability and corporate goals. Moreover, future research can analyse changes in corporate performance as a result of integrating green investment practices. Such studies enhance acquisition of conclusive outcomes regarding corporate green investment initiatives and firm performance.

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