

Fortune Ganda (South Africa), Collins C. Ngwakwe (South Africa), Cosmas Ambe (South Africa)

The role of corporate green investment practices on sustainable development

Abstract

This paper discusses fundamental roles of corporate green investment activities on sustainable development. This article undertook a conceptual exploration and identifies how firm green investment practices contributes to economic sustainability, social sustainability and environmental sustainability in pursuit of generating a green economy. The paper proposes a model on corporate green investment practice adoption, important in supporting sustainability objectives which are significant in generating a low-carbon or green economy.

Keywords: corporate green investment practices; green investment, sustainable development; economic sustainability, social sustainability, environmental sustainability, green economy, climate change.

JEL Classification: M14, Q01, Q42, Q54, Q56, Q57.

Introduction

Climate change represents one of the major environmental issues affecting the planet in the present scenarios and in the long-term perspective. Scientists who research climate issues posit that human practices have generated climate change to extend as high as over 90% (IPPC, 2007). Thus, climatologists highlight that worldwide atmospheric densities of nitrous oxide, methane and carbon dioxide have significantly heightened owing to human practices since 1970, and this increase has extended beyond pre-industrial values ascertained from ice cores of periods extending across numerous thousands of years (IPPC, 2007). More precisely, in the last 50 years anthropogenic issues have been noticeable as major contributors to climate change (Ding et al., 2001). For example, carbon emission concentrations have increased by 31% since the preindustrial period, from 280ppmv to 370ppmv in the present day, plus, it has further been determined that half of this carbon emission concentration has developed since 1965 (Karl and Trenberth, 2003). As such, it is reported that transformations in atmospheric concentrations of greenhouse gases (carbon dioxide, methane and nitrous oxide) plus aerosols, in relation to solar radiation has occurred and established structures on the land surface which changes the energy balance of the climate framework (Chapin et al., 2008; Clarke et al., 2007).

These shifts are shown with reference to radiative forcing, that has been employed to draw comparisons on how both natural and human influences stimulate cooling and warming factors on the worldwide climate (Solomon et al., 2007). Therefore, climate models express that climate change possible causes are, natural processes (solar activities plus volcanic dust covering), human factors (increase in carbon emissions and aerosol) plus combined natural and human factors (Root and Schneider, 2006). Nevertheless, findings prove that temperatures motivated through human

practices indicate a high positive relationship with noticeable climate change and phenological shifts in animals and plants (Root et al., 2005). As such worldwide heightening in carbon dioxide is a result of principally non-renewable energy employment plus land-use shifts (for example forestry, industrial activity, growth of cities), increases in nitrous oxide and methane that are largely owing to agricultural practices (IPCC, 2007). Research outline that corporations are principal users of non-renewable energy plus they own the largest and most of the agricultural businesses (Karl and Trenberth, 2003). In this regard, climate change has been identified as clear and unambiguous evidenced by heightening worldwide mean ocean and air temperatures, extended thawing of both ice and snow, plus a heightening of the worldwide mean sea level (Solomon et al., 2009).

Specifically, at oceanic, regional and continental capacities, many long-run transformations in relation to climate have also been identified (Maas and Tänzler, 2009). These are, for instance, shifts in Arctic ice and temperatures, extensive shifts in precipitation quantities, salinity of the ocean, shifts in wind directions and trends, plus an increased prevalence of natural catastrophes such as tropical cyclones, droughts, heat waves and increased precipitation (Maas and Tänzler, 2009). Moreover, ongoing extensive deforestation in Amazonia plus the increased desertification of the Sahel region have provided evidence of an anthropogenic impact on climate change on a regional capacity (Charney, 1975; Hahmann and Dickinson, 1997). This implies that permitted increases in carbon emissions in the 21st century will probably exceed 20th century levels with increased margins (Solomon et al., 2008; IPCC, 2007). Furthermore, forecasts in Business As Usual (BAU) context in this 21st century, using a sensitivity framework, rated at 2°C, show that when compared to the previous 1000 years, climate changes will increase to unprecedented levels (Crowley, 2000). Nonetheless, some corporations have begun to accept the concept of climate change (Eyraud et al., 2013).

This is indicated by some corporations embracing green investment practices such as, green energy technologies, green buildings, green financial products, carbon capture and storage, green supply chains, green logistics models, reforestation, hybrid vehicles, waste management, smart grid systems, energy saving activities plus green research and development (Eyraud et al., 2013; Kahlenhorn, 1999). Therefore, this study examined the role of corporate green investment practices on sustainable development.

The two major questions which stimulated this study are: What is the role of corporate green investment practices on sustainable development? What would be the properties of a framework to facilitate corporate green investment practice adoption? Therefore, this paper is important since the driving factors for human long-term climate change impacts such as population increase, economic factors (e.g. income per capita, regional variances), technological factors (energy provision, energy efficiency), land utilization (farmland, energy biomass), energy models (coal, oil, gas, renewables, nuclear) and agriculture require to be effectively harnessed in line with climate mitigation objectives (Karl and Trenberth, 2003; Houghton, 2007). However, if climate change is allowed to persist then humans will experience increases in vector borne diseases, shortage of food and fresh water, extreme temperatures, high acidification of ecosystems, displacement of settlements and high desertification (Tol, 2002; Houghton, 2007). The outlined goal (Article 2) of the United Nations Framework Convention on Climate Change (UNFCCC) is therefore to attain stable carbon emission levels to avoid “dangerous anthropogenic interference with the climate system.” (Solomon et al., 2009, p. 1704). Therefore, transition to low-carbon or green economy will demand widened green investment activities, particularly in the early stages of adoption (Zhu and Sarkis, 2004).

1. Conceptual framework

This section shall outline a brief analysis on two major concepts of this paper, namely corporate green investment practices and sustainable development.

1.1. Corporate green investment practices. Green investment practices indicate an important current business environmental accountability initiative. Green investment takes place when a firm funds environmentally compatible activities which are effective and considerably result in decreased employment of natural capital, support effectual removal of dangerous materials and minimise carbon emissions which spur on the acquisition of environmental advantages by producing green commodities (Robert Haßler, cited in Ecologic, 1998). Therefore,

green investment practices are low-carbon plus climate resilient investments such as green energy technologies, green buildings, green financial products, carbon capture and storage, green supply chains, green logistics models, reforestation, hybrid vehicles, waste management, smart grid systems, energy saving activities plus green research and development (Eyraud et al., 2013; Kahlenhorn, 1999). Prior literature has also shown diversified forms of corporate green investment activities.

For example, Rahim and Rahman (2013) analyzed published papers on Canadian, American and European companies and explain that some of these firms have incorporated green IT (environmentally compatible technologies and procedures) in the complete information and technology. E-firms have integrated green accounting or environmental accounting practices in their business practices as a result of, amongst others, the presence of emissions, trading markets, carbon tax and policy instruments which require the firm to recognise its negative environmental externalities. With reference to Australian companies Deegan (2013) highlights that these firms have integrated green accounting or environmental accounting practices in their business practices as a result of amongst others the presence of emissions trading markets, carbon tax and policy instruments which require the firm to recognise its negative environmental externalities. Barari et al. (2012) completed a study on a large textile company involved with garment production in Western India and illustrate that the firm promoted green manufacturing initiatives in different stages of garment production. Leonidou et al. (2013) evaluated 152 hotels in Greece and discovered that these hotels adopt an environmental marketing policy which is significant in these hotels gained competitive advantages. Caniato et al. (2012) undertook a research on 2 US global fashion companies and 3 fashion companies based in Italy and suggest that these fashion industry firms deployed environmental key performance indicators (KPIs) such as, recycled materials, product waste, water consumption, water pollution, carbon emissions, chemical substances, energy consumption, renewable energy and environmental certifications to manage the company’s environmental impacts in their supply chains and product life cycles.

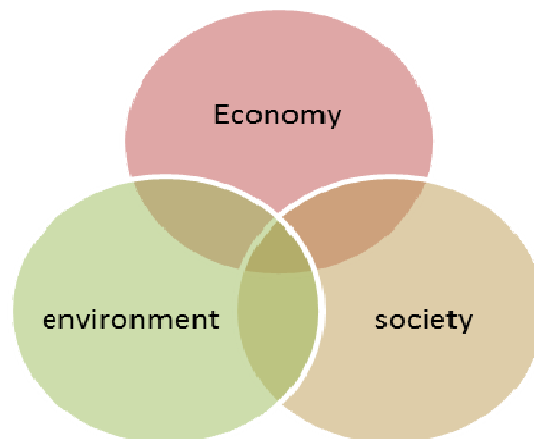
Tsai (2012) assessed a Taiwanese electronic industry and spotlights that this industry undertakes green research and development in schemes which relate to the development of new green products. Iatridis (2013) evaluated 529 Malaysian firms listed on Bursa Malaysia and highlights that the firms integrate a Sustainability Balanced Scorecard to effectively ascertain the company’s environmental and eco-

conomic performance. They possess environmental certifications such as ISO 14001 and they implemented both voluntary and mandatory environmental reporting. Wilson Bayly Holmes-Ovcon Ltd (2012) highlights that the company had incorporated “carbon management” procedures which permitted the firm to adapt, measure and report its carbon emissions in addition to ascertaining prospects and risks connected with climate change. The Vodacom Group (2010) outlines that the company had integrated green innovation approaches of handling business through doing away with conventional practices by applying “carbon-intensive” mechanisms such as video conferencing and machine to machine buying and selling practices to mitigate climate change. Anglo American Platinum (2012) illustrates that the mining company determines and measures its carbon emissions in line with environmental certification such as ISO 14064-1 requirements plus the Greenhouse Gas Protocol standards.

1.2. Sustainable development. *Our Common Future* widely known as the Brundtland Report (1987) defines sustainable development as “development that meets the needs of the present generation without compromising the ability of future generations

to meet their own needs” (UN, 1987, p. 43). This philosophy suggests that contemporary human economic operations should be greened (or be made sustainable) to ensure the preservation of the environment and society for posterity (Hsu, 2013; Santolaria et al., 2011). Hence this theory is a fusion of three important elements: environment, society and the economy (Adams, 2006). Therefore, sustainable development is viewed as designed towards striving to bring the constituents, namely, environment, society and economy together through producing an equilibrium state and reconciling their conflicts.

The model, shown, in Figure 1 below indicates equal sized rings which show a symmetrical interrelationship of the sustainable development constituents, although there is no valid reason which has been suggested to explain this interconnection. Hence, if the three categories are perceived as separate, various views can, in most cases, provide greater importance to one classification or another category. The overlapping structure of the three elements in Figure 1 indicates the transformation required to generate equilibrium between the environment, society and the economy (Tracey and Anne, 2008). Such equilibrium will thus lead to sustainable development.



Source: Brown E. (2013).

Fig. 1. Components of sustainable development

The economy element of sustainable development, often referred to as economic sustainability indicates that in the quest for economic emancipation, companies are anticipated to guarantee equitable allocation and employment of natural capital (Caniato et al., 2012). The social component indicates that corporations are expected to pursue economic gains in close recognition of societal needs for employment, health, education and human rights (UNDESA, 2012; 2001). The environmental component indicates that the corporation must not neglect, exploit or damage the natural environment as a result of their operations (Rao, 2002). The environment de-

serves preservation to its original existence and form (Sprenkel and Busch, 2011).

Therefore, green investment activities such as incorporation of environmentally compatible manufacturing frameworks, low-carbon technologies, green energy integration and promoting green buildings, should be supported in business undertakings (Eyraud et al., 2013; Kahlenborn, 1999). Corporate sustainability and/or green practices are corporate initiatives that ensure environmental sustainability, employee and customer long-run value through implementing green initiatives towards universal green stewardship (UNEP, 2011; Wang et al., 2013).

2. The role of corporate green investment practices on sustainable development

Corporate green investment practices are a constituent of the sustainable development initiative. Hence, in order to implement an exhaustive analysis of the role of corporate green investment practices on sustainable development, this paper, using Table 1 below, will examine this concept (sustainable development) under the following headings: economic sustainability, social sustainability and environmental sustainability with special emphasis on corporate green investment practices.

As demonstrated from Table 1 above, the role of corporate green investment practices on sustainable development was scrutinised under sections on economic sustainability, social sustainability and environmental sustainability. The primary economic sustainability objectives which were discussed in this section at corporate level are, green employment and generating income within corporations; supporting green innovation within corporate contexts; considering environmental externalities in the market and considering the economic situation of future generations. On the other hand, social sustainability themes with respect to corporate contexts that were discussed in this section were, preservation of health and safety, promoting education and free personal growth for sustainability, maintaining societal and cultural values for sustainability and fostering equality for sustainability. Then, key objectives in relation to environmental sustainability that companies should embrace towards promoting environmental sustainability explored in this section are: preservation of natural spaces and biodiversity; responsible employment of green energy; reduction of deployment of fossil fuels; preservation of the natural environment and preservation from environmental hazards and risks.

3. Theoretical framework: goal-framing theory

The goal-framing theory (Lindenberg and Steg, 2007), has been linked to corporate environmental behavior (Oikonomou et al., 2009). In their research, on “goals frames guiding environmental behavior” Lindenberg and Steg (2007, p. 117) assert that “goals frame the way people process information and act on it”. Therefore, when people set a goal, they are more likely to be receptive to information that may actualise the framed goal/s. Since therefore, the framed goals affect how people process information, receive and act upon it (Stern, 2000), the goal framing theory thus fits in within the context of corporate environmental behavior since the corporation has some set goals to achieve within its contemporary business environment that is constantly being dictated by adherence to emerging environmental and social issues

(Zsóka, 2008). Within a corporate context, the business has profitability goals as a core goal; but to achieve the profit goal, the corporation must maintain a sound corporate image, hence corporate image has also become a vital component of corporate goals (Wu, 2009; Aerts and Cormier, 2009). Accordingly, to meet profit and image goals, the corporation inherently becomes more receptive to environmental policies and thus work towards a practical application of public environmental expectations by adhering to regulations through environmental consciousness (Jahdi, 2007). Thus in this study, the goal framing theory is seen as fitting since it ties in with the corporate goal for profit and good image with corporate environmental initiatives.

4. Towards a model of corporate green investment practice adoption

In this study, the model on corporate green investment practice adoption explains that companies consider the natural environment as the major stakeholder (Antonietti and Marzucchi, 2013). Then, government through its green economy policy introduces environmental legislations which are designed to increase corporate accountability towards their natural environments. These environmental legislations can be applied at both industrial and firm level in order to induce broadened environmental engagement of companies (EU, 2009). Since these environmental legislations are characterised by high penalty charges, jail terms plus company suspension or closure features, top management teams of companies are forced to develop corporate environmental policies embedded in the company’s green vision in order to adhere to environmental legislations and preserve the company’s green reputation (Demirel and Kesidou, 2011; Johnstone, 2007). As such, companies begin to introduce green technologies and green designs in the firm’s operational framework which increase the firm’s environmental consciousness, reducing environmental litigation costs and fulfilling the company’s number one goal of increased profits as a result of better green productivity, energy efficiency and improved resource efficiency (Lin et al., 2013; Oikonomou et al., 2009). Companies therefore begin to support green behaviours and green lifestyles indicated by widened integration of green investment activities as they support both profitability and corporate image goals thereby making green companies to assume competitive advantage positions and create new green business prospects which enable the firm to acquire first mover advantages (Veisten, 2007; Zhu and Sarkis, 2004).

Improved green investment practice integration by companies can be in various forms. The processes are namely, green energy adoption, energy management practices, green buildings, energy auditing, efficient

energy mix, support of green financing decision consideration and development of green financial tools (Eyraud et al., 2013; Kahleborn, 1999). Other green practices are, waste management (reuse, reduce and recycle), green manufacturing processes and adoption of green standards which improve measurement of green metrics. These practices improve corporate environmental awareness, minimise green legal costs as a result of increased firm productivity and they earn and protect the firm's image. Moreover, companies are motivated to disclose their carbon footprint in addition to a widened environmental participation and reporting practice which serve to manage reputational risks and to establish mutual relationships with corporate stakeholders as such practices are perceived to be ethical and credible (Cagno et al., 2005; Iaditris, 2013).

Hence, zero carbon schemes that the company adopts are capable of reducing the firm's negative environmental impacts in addition to retaining highly qualified employees (experts) who improve and sustain firm productivity (Chan et al., 2014; Daily, 2007). Thus climate change mitigation issues in pursuit to lower carbon emissions foster the company to implement carbon reduction projects, carbon adaptation mechanisms, foster growth of climate markets, accelerate green financial investments of private companies to lower carbon emissions and enhance emancipation of green development schemes (Eyraud et al., 2013; Ecologic, 1998). Consequently, companies are able to affiliate with green interest groups, improve green consciousness, acquire high financial gains (from new green projects) and assume green industrial leadership positions (Eltayeb et al., 2011). Inevitably, greening by companies improves green company visibility and incorporation of green ideologies in the corporate culture. Thus, green cultures and green firm visibility are important issues which sustain the company's green long-term policy, encourage the firm's green belief systems, market the company's green brand and guarantee high firm competence in relation to other competitors (Liu, 2012; Tsai, 2012; Sullivan, 2009).

Therefore, from the foregoing analysis implemented above, the following model has been proposed to support corporate green investment practice adoption.

Implications of the model on corporate green investment practice adoption

An analysis on the implication of this model demonstrates that the natural environment should be considered the major stakeholder of the company as a result of heightening global environmental issues (Sullivan, 2009). These global environmental concerns are, climate change, deforestation, water quality and quantity, air pollution, biodiversity and land use, ozone layer depletion, chemicals and toxics, energy inefficiency plus oceans and fisheries issues (IPPC, 2007). It fol-

lows that these environmental concerns are supported by other green corporate stakeholders who have the "voice" to influence government practices through green policy adoption and enforcement of environmental legislation. These stakeholders are green consumers, green employees, environmental interest groups, green investors and green government agencies (Sprengel and Busch, 2011; Cronin et al., 2011). Therefore, green government initiatives in the form of green policy and environmental legislation put pressure on firms to integrate green investment practices. Examples of known green investment practices are, green energy adoption, green technology adoption, green buildings, waste management (reuse, reduce, recycle), energy efficiency and electric vehicles (Eyraud et al., 2013; Kahleborn, 1999).

Moreover, green manufacturing procedures, green logistics, green supply chains, environmental certification, green innovation, green accounting, carbon disclosure activities, green Information Technology integration and cleaner production represent important firm green programs (Chung and Tsai, 2007; Deegan, 2013; Eyraud et al., 2013; Eltayeb et al., 2011). Hence, the greening process generates significant impacts on the firm's profitability as the main focal goal of the firm through diverse approaches. Some of the profitability advantages associated with greening are, high green product marketability, green business opportunities, reduction in operating costs and green competitive advantages (African Bank Investments, 2011; Zhu and Sarkis, 2004). Furthermore, green productive efficiency, minimized green business risks, developed green financial instruments, increased market share plus high resource efficiency indicate important financial benefits associated with corporate green investment initiatives (Fonseca and Jabbour, 2012; Cronin et al., 2011).

Thus, once the firm acquires high profits, other background goals (corporate image, environmental consciousness and legislation issues) are also simultaneously affected thereby strengthening the firm's green competence as a result of positive benefits produced by greening. Therefore, corporate green image benefits are, positive public relations, firm legitimization, improved customer trust and credibility of the firm's products, achieved green industrial leadership of the company, positive media reports and sustained corporate green lifestyle and green cultures (Chan et al., 2014; Aerts and Cormier, 2009; Azim et al., 2009).

On the other hand, environmental legislation connected benefits are, an efficient environmental compliance framework, lowered environmental fines and penalties, valid environmental licences and permits, reduced environmental legal prosecutions and positive firm government relationships (EU, 2009; Jahdi, 2007; Wu, 2009). Consequently, the firm is able to sustaina-

bly provide goods and services which result in sustainable consumption on the part of the consumer through improved health, environmental education, preserved natural environment and reduced firm and consumer conflicts. Thus, sustainable consumption does not deprive future generations of the same benefits the present generation has, thereby promoting sustainable development (Adams, 2006).

Conclusion

This paper discussed the role of firm green investment initiatives on sustainable development. The concept of sustainable development is divided into three constituents namely, economic sustainability, social sustainability and environmental sustainability. Therefore, the principal economic sustainability goals that were presented in this paper within corporate contexts are, green employment and generating income within corporations; supporting

green innovation within corporate contexts; considering environmental externalities in the market and considering the economic situation of future generations. Social sustainability themes at corporate level discussed in this study include, preservation of health and safety, promoting education and free personal growth for sustainability, maintaining societal and cultural values for sustainability and fostering equality for sustainability. Lastly, the main environmental sustainability objectives explained at organisational capacity are, preservation of natural spaces and biodiversity; responsible employment of green energy; reduction in deployment of fossil fuels; preservation of the natural environment and preservation from environmental hazards and risks. The model suggested in this paper does further support the role that the company green investment initiative has towards fostering sustainable development objectives in pursuit of generating low-carbon or green economies.

References

1. Adams, W.M. (2006). *The future of Sustainability: Re-thinking Environment and Development in the Twenty-first Century*. Report on ICUN Renowned Thinkers Meeting, ICUN publication.
2. Aerts, W. & Cormier, D. (2009). Media legitimacy and corporate environmental communication, *Accounting, Organizations and Society*, 34 (1), pp. 1-27.
3. African Bank Investments (2011). *Sustainability Report 2011*. African Bank publication.
4. Aldy, J.E., Krupnick, A.J., Newell, R.G., Parry, I.W.H. & Pizer, W.A. (2010). Designing climate mitigation policy, *Journal of Economic Literature*, 48 (4), pp. 903-934.
5. Anglo American Platinum (2012). *Sustainability Report 2012*. Anglo reports.
6. Antonietti, R. & Marzucchi, A. (2013). *Green investment strategies and export performance: A firm-level investigation*, FEEM Nota di Lavoro N 76.2013.
7. Antrop, M. (2003). The role of cultural values in modern landscape, in *Landscapes interfaces: Cultural heritage in changing landscapes*, edited by H. Palang & G. Fry. Dordrecht: Kluwer Academic, pp. 91-108.
8. Arundel, A. & Kemp, R. (2009). *Measuring Eco-innovation*. Working Paper Series 17. United Nations University-Merit.
9. Azim, M., Ahmed, S. & Islam, S. (2009). Corporate social reporting practice: Evidence from listed companies in Bangladesh, *Journal of Asia-Pacific Business*, 10 (2), pp. 130-145.
10. Barari, S., Agarwal, G., Zhang, W.J., Mahanty, B. & Tiwari, M.K. (2012). A decision framework for the analysis of green supply chain contracts: An evolutionary game approach, *Expert Systems with Applications*, 39, pp. 2965-2976.
11. Baris, K. & Kucukali, S. (2012). Availability of renewable energy sources in Turkey: Current situation, potential, government policies and the EU perspective, *Energy Policy*, 42, pp. 377-391.
12. Berrone, P. & Gomez-Mejia, L.R. (2009). Environmental performance and executive compensation: an integrated agency-institutional perspective, *Academy of Management Journal*, 52 (1), pp. 103-126.
13. BIS (2007). *Occupational health and Safety Management Systems*. Specification (BSOHAS 18001:2007). British Standard Institution.
14. Brown, E. (2013). *Frameworks for development*. Available at: <http://sageography.myschoolstuff.co.za/geowiki/grade-11-caps/development-geography/frameworks-for-development/> [Accessed 13 June 2014].
15. Cagno, E., Trucco, P. & Tardini, L. (2005). Cleaner production and profitability: analysis of 134 industrial pollution prevention (P2) project reports, *Journal of Cleaner Production*, 13, pp. 593-605.
16. Caniato, F., Caridi, M., Crippa, L. & Moretto, A. (2012). Environmental sustainability in fashion supply chains: An exploratory case based research, *Int. J. Production Economics*, 135, pp. 659-670.
17. Chan, E.S.W., Hon, A.H.Y., Chan, W. & Okumus, F. (2014). What drives employees' intentions to implement green practices in hotels? The role of knowledge, awareness, concern and ecological behavior, *International Journal of Hospitality Management*, 40, pp. 20-28.
18. Chapin III, F.S., Randerson, J.T., McGuire, A.D., Foley, J.A. & Field, C.B. (2008). Changing feedbacks in the climate-biosphere system, *Frontiers in Ecology and the Environment*, 6 (6), pp. 313-320.
19. Charney, J.G. (1975). Dynamics of deserts and droughts in Sahel, *QJR Meteorological Society*, 101, pp. 193-202.
20. Chung, Y. & Tsai, C. (2007). The effect of green design activities on new product strategies and performance: an empirical study among high-tech companies, *International Journal of Management*, 24 (2), pp. 276-288.

21. Clarke, L., Edmonds, J., Jacoby, H., Pitcher, H., Reilly, J. & Richels, R. (2007). Scenarios of greenhouse gas emissions and atmospheric concentrations, *US Department of Energy Publications*, 6.
22. Clarkson, P.M., Li, Y., Richardson, G.D. & Vasvari, F.P. (2011). Does it really pay to be green? Determinants and consequences of proactive environmental strategies, *Journal of Accounting and Public Policy*, 30 (2), pp. 122-144.
23. Convention on Biological Diversity (2007). *What is biodiversity?* Available at: http://www.biodiv.be/biodiversity/about_biodiv/biodiv-what [Accessed 21 July 2014].
24. Cronin, J.J., Smith, J.S., Gleim, M.R., Ramirez, E. & Martinez, J.D. (2011). Green marketing strategies: An examination of stakeholder and the opportunities they present, *Journal of the Academy of Marketing Science*, 39, pp. 158-174.
25. Crowley, T.J. (2000). Causes of climate change over the past 1000 years, *Science*, 289 (5477), pp. 270-277.
26. Daily, B.F., Bishop, J.W. & Steiner, R. (2007). The mediating role of EMS teamwork as it pertains to hr factors and perceived environmental performance, *Journal of Applied Business Research*, 23 (1), pp. 95-110.
27. Dascalu, C., Caraianni, C., Lungu, C., Colceag, F. & Guse, G.R. (2010). The externalities in social environmental accounting, *International Journal of Accounting and Information Management*, 18 (1), pp. 19-30.
28. Deegan, C. (2013). The accountant will have a central role in saving the planet ... really? A reflection on 'green accounting and green eyeshades twenty years later', *Critical Perspectives on Accounting*, 24, pp. 448-458.
29. De Freitas, C.R. (2003). Tourism Climatology: evaluating environmental information for decision making and business planning in the recreation and tourism sector, *International Journal of Biometeorology*, 48 (1), pp. 45-54.
30. Demirel, P. & Kesidou, E. (2011). Stimulating different types of eco-innovation in the UK: Government policies and firm motivations, *Ecological Economics*, 70 (8), pp. 1546-1557.
31. Ding, Y.D.J.G., Griggs, D.J., Noguer, M., Van der Linden, P.J., Dai, X., Maskell, K. & Johnson, C.A. (2001). *Climate change 2001: the scientific basis* (Vol. 881). Cambridge: Cambridge university press.
32. Du, S., Bhattacharya, C.B. & Sen, S. (2010). Maximizing business returns to corporate social responsibility (CSR): the role of CSR communication, *International Journal of Management Reviews*, 12 (1), pp. 8-19.
33. Ecologic (1998). Green Investment: Market Transparency and Consumer Information. Workshop Summary-Proceedings of the International Workshop, Berlin, 07 October 1998. Berlin: Ecologic.
34. Eltayeb, T.K., Zailani, S. & Ramayah, T. (2011). Green supply chain initiatives among certified companies in Malaysia and environmental sustainability: Investigating the outcomes, *Resources, Conservation and Recycling*, 55, pp. 495-506.
35. European Union EU (2009). *Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC*. European Union: Off.J.Eur.Union L 140 (16).
36. Eyraud, L., Clements, B. & Wane, A. (2013). Green investment: Trends and determinants, *Energy Policy*, 60, pp. 852-865.
37. Feagin, J.R. (2014). *Racist America: Roots, current realities, and future reparations*. Routledge.
38. Fonseca, S.A. & Jabbour, C.J.C. (2012). Assessment of business incubators' green performance: A framework and its application to Brazilian cases, *Technovation*, 32, pp. 122-132.
39. Frey, G.W. & Linke, D.M. (2002). Hydropower as a renewable and sustainable energy resource meeting global energy challenges in a reasonable way, *Energy policy*, 30 (14), pp. 1261-1265.
40. Frondel, M., Horbach, J. & Rennings, K. (2007). End-of-pipe or cleaner production? An empirical comparison of environmental innovation decisions across OECD countries, *Business Strategy and the Environment*, 16 (8), pp. 571-584.
41. Fryxell, G.E., Lo, C.W. & Chung, S.S. (2004). Influence of motivations for seeking ISO 14001 certification on perceptions of EMS effectiveness in China, *Environmental Management*, 33, pp. 239-251.
42. Gabaldón-Estevan, D., Criado, E. & Monfort, E. (2014). The green factor in European manufacturing: a case study of the Spanish ceramic tile industry, *Journal of Cleaner Production*, 70, pp. 242-250.
43. Hahmann, A.N. & Dickinson, R.E. (1997). RCCM2-BATS model over tropical South America: Applications to tropical deforestation, *Journal of Climate*, 10 (8), pp. 1944-1964.
44. Hillman, A.J. & Keim, G.D. (2001). Shareholder value, stakeholder management, and social issues: What's the bottom line? *Strategic Management Journal*, 22, pp. 125-139.
45. Hofstede, G. (2001). *Culture's consequences: comparing values, behaviours, institutions and organisations across nations*. Sage, CA: Thousand Oaks.
46. Houghton, D.D. (2007). *Global Climate Change: Basics, Challenges, and International Impacts*. Richland Center, WI: Brewer Public Library.
47. Hsu, C., Tan, K.C., Zailani, S.H.M. & Jayaraman, V. (2013). Supply chain drivers that foster the development of green initiatives in an emerging economy, *International Journal of Operations & Production Management*, 33 (6), pp. 656-688.
48. Iatridis, G.E. (2013). Environmental disclosure quality: Evidence on environmental performance, corporate governance and value relevance, *Emerging Markets Review*, 14, pp. 55-75.
49. Intergovernmental Panel on Climate Change IPCC (2007). *Climate Change 2007. The physical science basis: Working Group I Contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press.

50. Jahdi, K.S. (2007). Pease Drum and Tank Recycling and Reconditioning: The Impact of Legislation and Limitations on Being Green, *Social Responsibility Journal*, 3 (2), pp. 68-72.
51. Johnstone, N., Glachant, M., Serravalle, C.S., Riedinger, N., Scapecchi, P. (2007). Many a slip 'twixt the cup and the lip': direct and indirect public policy incentives to improve corporate environmental performance, in *Environmental Policy and Corporate Behaviour*, edited by Johnstone N. Northampton, MA: Edward Elgar Publishing, pp. 88-141.
52. Kabat, P. (Ed.) (2004). *Vegetation, Water, Humans and the Climate: A New Perspective on an Interactive System*, Springer.
53. Kahlenborn, W. (1999). Transparency and the Green Investment Market, *Greener Management International*, 27, pp. 65-78.
54. Karl, T.R. & Trenberth, K.E. (2003). Modern Global Climate Change, *Science*, 302, pp. 1719-1722.
55. Laudal, T. (2012). Rising externality costs and corporate social responsibility case: EU legislation on electric and electronic equipment, *Social Responsibility Journal*, 8 (2), pp. 289-304.
56. Leonidou, L.C., Leonidou, C.N., Fotiadis, T.A. & Zeriti, A. (2013). Resources and capabilities as drivers of hotel environmental marketing strategy: Implications for competitive advantage and performance, *Tourism Management*, 35, pp. 94-110.
57. Lin, R., Tan, K. & Geng, Y. (2013). Market demand, green product innovation, and firm performance: evidence from Vietnam motorcycle industry, *Journal of Cleaner Production*, 40, pp. 101-107.
58. Lindenberg, S. & Steg, L. (2007). Normative, gain and hedonic goal-frames guiding environmental behavior, *Journal of Social Issues*, 65 (1), pp. 117-137.
59. Liu, Y. (2012). An empirical research of awareness, behaviour and barriers to enact carbon management of industrial firms in China, *Science of the Total Environment*, 425, pp. 1-8.
60. Maas, A. & Tänzler, D. (2009). Regional security implications of climate change. A synopsis. *Adelphi*, Berlin.
61. Mathur-Helm, B. (2005). Equal opportunity and affirmative action for South African women: a benefit or barrier? *Women in Management Review*, 20 (1), pp. 56-71.
62. Monti, A. (2002). *Environmental risks and insurance: A comparative analysis of the role of insurance in the management of environment-related risks*, OECD publication.
63. OECD, Organisation for Economic Co-operation and Development OECD (2009). *Society at a glance. 2009-OECD Social Indicators*. Available at: <http://www.oecd.org/els/social/indicators/SAG> [Accessed 15 July 2014].
64. Oikonomou, V., Becchis, F., Steg, L. & Russolillo, D. (2009). Energy saving and energy efficiency concepts for policy making, *Energy Policy*, 37 (11), pp. 4787-4796.
65. Omer, A.M. (2008). Green energies and the environment, *Renewable and Sustainable Energy Reviews*, 12, pp. 1789-1821.
66. Pajunen, N., Watkins, G., Wierink, M. & Heiskanen, K. (2012). Drivers and barriers of effective industrial material use, *Minerals Engineering*, 29, pp. 39-46.
67. Pellegrino, C. & Lodhia, S. (2012). Climate change accounting and the Australian mining industry: exploring the links between corporate disclosure and the generation of legitimacy, *Journal of Cleaner Production*, 36, pp. 68-82.
68. Pons, M., Bikfalvi, A., Llach, J. & Palcic, I. (2013). Exploring the impact of energy efficiency technologies on manufacturing firm performance, *Journal of Cleaner Production*, 52, pp. 134-144.
69. Rahim, R.E.A. & Rahman, A.A. (2013). Applicability of resource-based environmental studies in Green IT, *Journal of Systems and Information Technology*, 15 (3), pp. 269-286.
70. Rao, P. (2002). Greening the supply chain: a new initiative in South East Asia, *International Journal of Operation and Production Management*, 22 (6), pp. 632-655.
71. Rickinson, M. (2001). Learners and learning in environmental education: A critical review of evidence, *Environmental Education Research*, 7 (3), pp. 207-320.
72. Root, T.L., MacMynowski, D.P., Mastrandrea, M.D. & Schneider, S.H. (2005). Human-modified temperatures induce species changes: joint attribution, *Proceedings of the National Academy of Sciences of the United States of America*, 102, pp. 7465-7469.
73. Root, T.I. & Schneider, S.H. (2006). Conservation and Climate Change: the Challenges Ahead, *Conservation Biology*, 20 (3), pp. 706-708.
74. Santolaria, M., Oliver-Sola, J., Gasol, C.M., Morales-Pinzón, T. & Rieradevall, J. (2011). Eco-design in innovation driven companies: perception, predictions and the main drivers of integration, *Journal of Cleaner Production*, 19, pp. 1315-1323.
75. Schumacher, I. (2010). Ecolabeling, consumers' preferences and taxation, *Ecological Economics*, 69, pp. 2202-2212.
76. SFDPH (2014). *The three hazards to food*. San Francisco Department of Public Health publication.
77. Shin, D., Curtis, M., Huisingh, D. & Zwetsloot, G.I. (2008). Development of a sustainability policy model for promoting production: a knowledge integration approach, *Journal of Cleaner Production*, 16, pp. 1823-1837.
78. Silalertruksa, T., Gheewala, S.H., Hunecke, K. & Fritsche, U.R. (2012). Biofuels and employment effects: Implications for socio-economic development in Thailand, *Biomass and Bioenergy*, 46, pp. 409-418.
79. Sinkin, C., Wright, C.J. & Burnett, R.D. (2008). Eco-efficiency and firm value, *Journal of Accounting and Public Policy*, 27 (2), pp. 167-176.

80. Solomon, S., Plattner, G.K., Knutti, R. & Friedlingstein, P. (2009). Irreversible climate change due to carbon dioxide emissions, *Proceedings of the national academy of sciences*, 106 (6), pp. 1704-1709.
81. Solomon, S., Plattner, G., Knutti, R. & Friedlingstein, P. (2008). Irreversible climate change due to carbon dioxide emissions, *PNAS*, 106 (6), pp. 1704-1709.
82. Sprengel, D.C. & Busch, T. (2011). Stakeholder engagement and environmental strategy – the case of climate change, *Business Strategy and the Environment*, 20 (6), pp. 351-364.
83. Stern, P.C. (2000). Toward a coherent theory of environmentally significant behavior, *Journal of Social Issues*, 56 (3), pp. 407-424.
84. Sullivan, R. (2009). The management of greenhouse gas emissions in large European companies, *Corporate Social Responsibility and Environmental Management*, 16, pp. 301-309.
85. Sukhdev, P. (2008). *The economics of ecosystems and biodiversity*. Na.
86. Tol, R.S.J. (2002). Estimates of the Damage Costs of Climate Change: *Part II. Dynamic Estimates*. *Environmental and Resource Economics*, 21, pp. 135-160.
87. Tracey, S. & Anne, B. (2008). *OECD Insights Sustainable Development Linking Economy, Society, Environment: Linking Economy, Society, Environment*, OECD Publishing.
88. Tsai, C. (2012). A research on selecting criteria for new green product development project: taking Taiwan consumer electronics products as an example, *Journal of Cleaner Production*, 25, pp. 106-115.
89. United Nations Department of Social and Economic Affairs UNDESA (2012). *World Economic and Social Survey 2012: In Search of New Development Finance*, New York: United National Department Economic Social.
90. United Nations Department of Social and Economic Affairs UNDESA (2001). *Indicators of Sustainable Development: Framework and Methodologies*, New York: United Nations.
91. United Nations Report, (UN) (1987). *Report of the World Commission on Environment and Development, General Assembly Resolution 42/187*. United Nations.
92. UNEP, United Nations Environmental Program (2012). *Global Outlook on Sustainable Consumption and Production Policies- taking action together*, Paris: UNEP.
93. UNEP, United Nations Environmental Program (2011). *Towards a green economy: pathways to sustainable development and poverty eradication*, Available at: http://www.unep.org/green_economy/ [Accessed 14 July 2014].
94. UNESCO (1972). *Convention concerning the protection of the world cultural and natural heritage*. Adopted by the General Conference at its seventeenth session. November 16, 1972, Paris: UNESCO.
95. UNESCO (2003). *Cultural landscapes: The challenges of conservation Proceedings of the workshop*, November 11-12, 2002. Ferrara, Italy. UNESCO World Heritage Papers No.7, Paris: UNESCO.
96. Veisten, K. (2007). Willingness to pay for eco-labelled wood furniture: choice-based conjoint analysis versus open-ended contingent valuation, *Journal of Forest Economics*, 13 (1), pp. 29-48.
97. Vodacom Group (2010). *Group Sustainability Report 2010*, Vodacom publication.
98. Wang, L., Toppinen, A. & Juslin, H. (2013). Use of wood in green building: a study of expert perspectives from the UK, *Journal of Cleaner Production*, xxx, pp. 1-12.
99. Wee, Y.S. & Quazi, H.A. (2005). Development and validation of critical factors of environmental management, *Industrial Management & Data Systems*, 105 (1), pp. 96-114.
100. Wehling, C., Hernandez, A.G., Osland, J., Osland, A., Deller, J. & Tanure, B. (2009). An exploratory study of the role of HRM and the transfer of German MNC sustainability values to Brazil, *European Journal of International Management*, 3 (2), pp. 176-198.
101. Wilson Bayly Holmes-Ovcon Ltd. (2012). *Integrated Annual Report 2011*. WBHO publication.
102. Wright, T., Colgan, F. & McKearney, A. (2006). Professional insights – lesbian, gay and bisexual workers: equality, diversity and inclusion in the workplace, *Equal Opportunities International*, 25 (6), pp. 465-70.
103. Wu, J. (2009). Environmental compliance: The good, the bad, and the super green, *Journal of Environmental Management*, 90, pp. 3363-3381.
104. Yin, H. & Powers, N. (2010). Do state renewable portfolio standards promote in-state renewable generation? *Energy Policy*, 38 (2), pp. 1140-1149.
105. Younger, M., Morrow-Almeida, H.R., Vindigni, S.M. & Dannenberg, A.L. (2008). The built environment, climate change and health: opportunities for co-benefits, *American Journal of Preventive Medicine*, 35 (5), pp. 517-526.
106. Zhu, Q. & Sarkis, J. (2004). Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing companies, *Journal of Operations Management*, 22 (3), pp. 265-289.
107. Zsóka, A.N. (2008). Consistency and “awareness gaps” in the environmental behaviour of Hungarian companies, *Journal of Cleaner Production*, 16, pp. 322-329.

Appendix

Table 1. Findings on the role of corporate green investment practices in relation with economic sustainability, social sustainability and environmental sustainability

Economic sustainability	Social sustainability	Environmental sustainability
<p>Green employment and generating income</p> <ul style="list-style-type: none"> - ends war on poverty through job creation (Chung and Tsai, 2007); - foreign owned companies add to the host nation production capacity at a greater rate than dependence on local sources of saving (Wehling et al., 2009); - green sectors which local firms fail to invest are developed by foreign owned companies (Antonietti and Marzucchi, 2013); - foreign owned companies enhance transfer of green expertise and technologies which assists performance of local industries (Shin et al., 2008) thereby closing green idea gaps between nations; promotes green technology diffusion plus acquisition of superior green skills (Santolaria et al., 2011); - spur growth of low-carbon environments, reduction of pollution plus waste (Daily et al., 2007); - green energy use generates savings from reduced consumption of traditional energy sources (coal, kerosene, firewood) (Omer, 2008); - green technologies are clean and environmentally friendly thereby reducing impact of respiratory diseases (Younger et al., 2008); - tourism and recreation activities in form of night markets, festivals and carnivals develop thereby providing more jobs (De Freitas, 2003); - reduce unemployment hence add to overall national economic development (Silertruska et al., 2012); - propel growth of other economic sectors (green banking and green legal services etc.) (Silertruska et al., 2012). <p>Supporting green innovation</p> <ul style="list-style-type: none"> - minimize corporate environmental damage (Frondel et al., 2007); - enhance the firm to adhere to national green law interests, satisfy stakeholder demands and meet industrial green benchmarks (Wu, 2009); - promote continuous green performance required to foster superior industrial and overall national economic performance (Berrone and Gomez-Mejia, 2009); - lead to development of collaborations between suppliers and the firm on green issues which inspire production of green commodities (Rao, 2002); - support resource efficiency and reduce manufacturing expenses (Jahdi, 2007); - increase firm environmental consciousness (Sullivan, 2009); - assist companies to develop original methods that transform waste into saleable commodities (Sinkin et al., 2008); - enhance companies to overcome inertia and integrate new green knowledge (Gabaldón-Estevan et al., 2014). <p>Considering environmental externalities in the market</p> <ul style="list-style-type: none"> - discourage firm self-motivated goals (profit-oriented) which increase pollution plus damage the environment (Demirel and Kesidou, 2011); - extended costs to the public in form of health problems and environmental damage are reduced (Clarkson et al., 2011); - makes companies to internalize negative environmental externalities hence bears all, or part of the costs (Laudal, 2012); 	<p>Preservation of health and safety</p> <ul style="list-style-type: none"> - employee training stimulates them to develop a suitable mind-set towards their work and their morale (OECD, 2009); - Occupational health and safety (OH&S) objectives support establishment of green buildings which promote water efficiency, recycling of materials and use of green technologies (Wang et al., 2013); - minimize accidents and reduce risks (dust, carbon emissions, noise, high temperatures) at the workplace (BIS, 2007; UNDESA, 2012); - OH&S approved and environmentally compatible infrastructures attracts and retain highly qualified and productive employees (Johnstone et al., 2007); - permit the company to support food distribution practices, donations through medical supplies and implement public health education activities (UNDESA, 2001); - supports product safety which reduce death, injury, sickness or undesirable impacts to persons or equipment (Lin et al., 2013); - foster growth of environmentally certified products (Fryxell et al., 2004); - green products improve quality of life of the user or consumer (sustainable consumption) (Schumacher, 2010). <p>Promoting education and free personal growth for sustainability</p> <ul style="list-style-type: none"> - promotes social transformation, improve consciousness to new green advancements, provides adequate green training, and trains scientists to create green technologies (African Bank Investments, 2011); - equips the company with green knowledge which encourage the public to acquire broader awareness on the natural environment and green technology (Wee and Quazi, 2005); - empower the firm to obtain green skills important realize sustainable development goals (Chan et al., 2014); - is an important tool which enable professionals to understand diverse and complex environmental challenges, by incorporating unified solutions and instituting proactive environmental initiatives (Rickinson, 2001); - prepare employees to act as responsible citizens on environmental issues (Zsóka, 2008); - enhance application of applied processes of gaining knowledge through contexts which are not restrained by definite limits (as in conventional educational settings), but are inquiry and practically oriented (Arundel and Kemp, 2009). <p>Maintaining societal and cultural values for sustainability</p> <ul style="list-style-type: none"> - propel creation of democratic, equity oriented, happy, healthy and secured societies (Azim et al., 2009); - the community's paintings, buildings, sculptures, archaeological natural environment, plus human-made scenery is preserved (UNESCO, 1972); - portraits, knowledge, expertise, tools, artefacts and cultural spaces of local communities are protected (UNESCO, 2003); - "healthy" interrelationships between the company and society are developed (Hofstede, 2001); - enhance the firm to respond to local cultural and societal values thereby gaining social acceptability (Du et al., 2010); 	<p>Preservation of natural spaces and biodiversity</p> <ul style="list-style-type: none"> - protects natural habitats and different forms of species (Convention on Biological Diversity, 2007); - sustains and restores natural environments (Baris and Kucukali, 2012); - enhance protection of natural green spaces, namely, farmlands, forests and wetlands (Sukhdev, 2008; UNEP, 2012); - supports maintenance of the natural environment carrying capacity (Aldy, 2010); - encourage non-disturbance of specie transitions and naturalness of the area (Pellegrino and Lodhia, 2012). <p>Responsible employment of green energy</p> <ul style="list-style-type: none"> - promotes energy security factors, mitigate climate change, and address new energy system requirements (Fonseca and Jabbour, 2012); - adoption generally improve corporate and stakeholder environmental consciousness (Omer, 2008); - protects the natural environment from damage (IPPC, 2007); - motivates increased green research and development (UNEP, 2011); - such policies are compatible and consistent with green economy demands (Yin and Powers, 2010); - generates green employment and income to local societies which improve standards of living (EU, 2009); - have the ability to recycle and regenerate by natural procedures, hence are clean (IPPC, 2007). <p>Reduction of deployment of fossil fuels</p> <ul style="list-style-type: none"> - have contributed to continual increase in carbon emissions that has produced negative effects such as, namely, increasing sea levels leading to damage of coastal areas, increased occurrence of droughts, heavy precipitation in some locations, extended environmental damage, low agricultural produce, high death rate and malnutrition plus possible extinction of both endangered and non-endangered species (IPPC, 2007); - are non-renewable resources which do not replenish themselves at an adequate rate for continued economic employment in relation to human timeframes (Frey and Linke, 2002); - continual use of non-renewable energy will also hinder growth and competitiveness of green energy resources (Omer, 2008); - are associated with energy insecurity issues (physical unavailability of these resources owing to depletion, plus volatility and uncompetitiveness associated with energy prices) (IPPC, 2007); - generates acid rain which damages monuments and buildings plus lower agricultural productivity owing to high acidification of the soils; - extraction of resources such as coal and oil also destroy aquatic life in oil spill incidences, damages land for agricultural activities, produces nasty smells which causes health problems, they are associated with greater transportation challenges and the resources are generally dirty; - combustion procedures of fossil fuels destroy the ozone layer hence harmful Ultra Violet (UV) rays which are permitted to gain entrance through damaged ozone holes causes skin cancer on human beings.

Table 1 (cont.). Findings on the role of corporate green investment practices in relation with economic sustainability, social sustainability and environmental sustainability

Economic sustainability	Social sustainability	Environmental sustainability
<ul style="list-style-type: none"> - creates a better functioning national economic market and private context (Dascalu et al., 2010); - force companies to incorporate environmental preservation approaches and green innovation (Sprengel and Busch, 2011); - discourage manufacture of non-green commodities (Veisten, 2007); - promotes economic welfare initiatives (Pons et al., 2013). <p>Considering economic situation of future generations</p> <ul style="list-style-type: none"> - firm greening policy reduce considerable declination of natural resources (Pajunen et al., 2012); - corporate greening strategy reduce vulnerability of continued increase in environmental damage in the future (IPPC, 2007); - green policy is expected to pay future generations on negative environmental externalities produced, and provide sufficient funding mechanisms which ensure transition to low-carbon environments (Eltayeb et al., 2011). 	<ul style="list-style-type: none"> - social legitimacy enables the firm to access superior strategic resources thereby propelling green economic emancipation (Aerts and Cormier, 2009); - firm engagement with local cultural heritage contexts foster generation of creative companies and eventually a creative economy (Antrop, 2003); - improve firm planning procedures and reduce costs by not participating in activities that do not benefit the local people (Hillman and Kleim, 2001); - improve stakeholder participation in company practices (Cronin et al., 2011). <p>Promoting equality for social sustainability</p> <ul style="list-style-type: none"> - supports minor racial groups and women by not experiencing hindrances at the workplace thereby promoting career progression (Mathur-Helm, 2005); - assist companies to address challenges associated with discrimination, unfavorable working conditions and injustice (Feagin, 2014); - enhance the firm to consider current topical issues on religion, age and sexuality (Wright et al., 2006); - promotes employee rights as stated in government constitution (Feagin, 2014); - equality issues are developed by considering local community attributes instead of adopting global perceptions (UNDESA, 2012); - equality fostered by the company enhance reduction of poverty, alleviation of destitution, promotes solidarity, collaboration and self-respect (UNDESA, 2001). 	<p>Preservation of the natural environment</p> <ul style="list-style-type: none"> - implementation of environmental protection practices can minimize environmental effects and improve firm productive capacity at the same time (Zhu and Sarkis, 2004); - cleaner production practices prevents generation of pollution in the production procedures through process innovation (Cagno et al., 2005); - the firms stakeholders who include suppliers, shareholders, employees, competitors, government, media and rivals are also stimulated to become more environmentally conscious (Liu, 2012; Hsu et al., 2013). <p>Promoting preservation from environmental hazards and reduction of environmental risks</p> <ul style="list-style-type: none"> - biological hazards which include, medical waste, parasites, disease causing bacteria and toxins or viruses that threaten human health and other living organisms are prevented (SFDPH, 2014); - chemical hazards that refer to toxic substances which when exposed to humans cause extensive carcinogenicity, irritation, flammability, reactivity, corrosiveness and sensitization are avoided (SFDPH, 2014); - environmental hazards which embrace issues such as contamination and pollution (environmental liability risk) plus storms, flood, tsunamis and earthquakes (natural catastrophe risk) are mitigated (Monti, 2002); - Psychological hazards such as wilful environmental negligence and consumer green aggressions are also prevented.

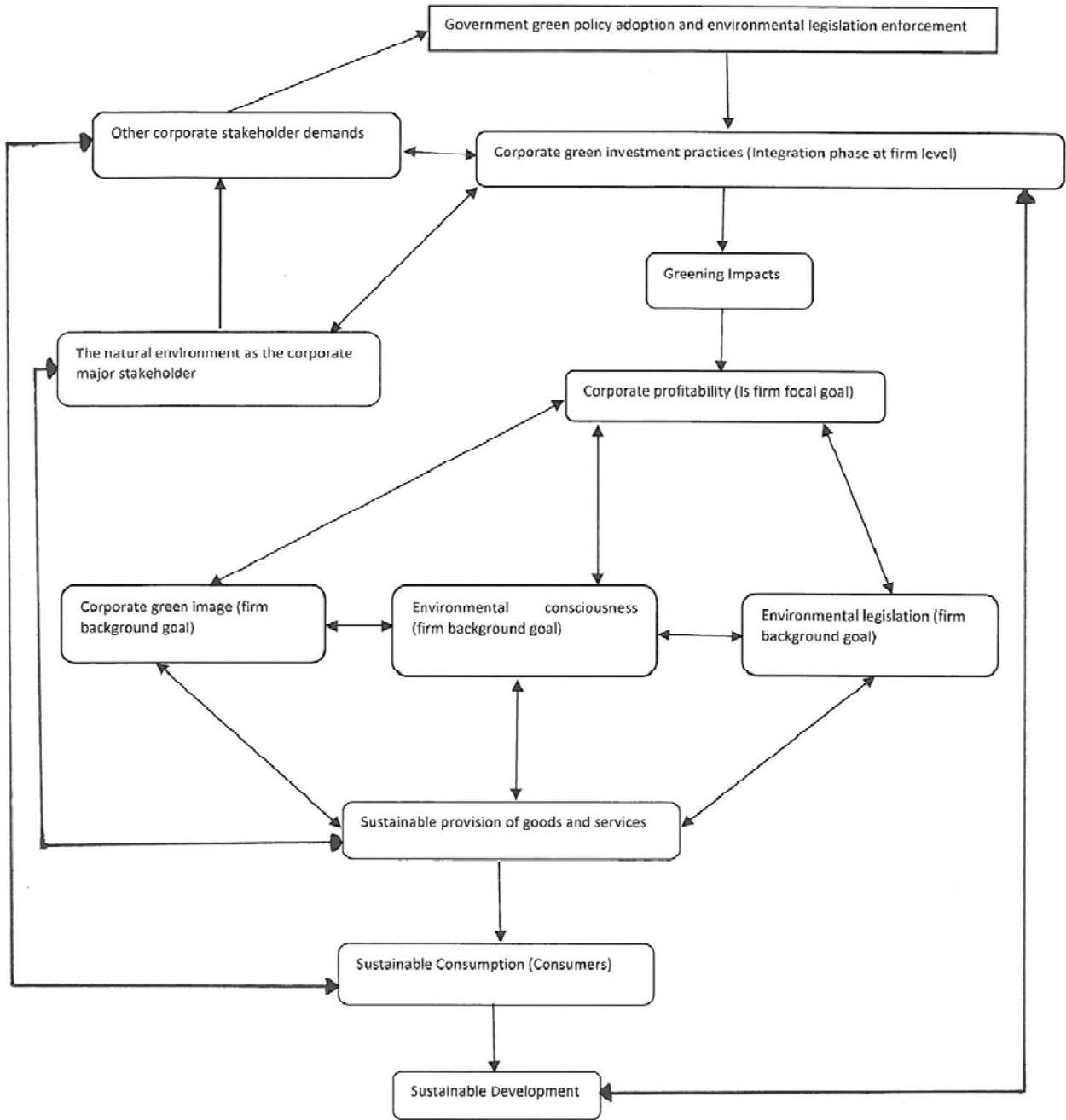


Fig. 2. A model on corporate green investment practice adoption