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MODERATING EFFECT OF FINANCIAL STRENGTH ON THE RELATIONSHIP BETWEEN CORPORATE GOVERNANCE AND ENVIRONMENTAL SUSTAINABILITY DISCLOSURES: EVIDENCEFROM NAIROBI SECURITIES EXCHANGE LISTEDFIRMS,KENYA

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A Thesis Submitted to the Board of Graduate Studies in Partial Fulfilment of the Requirements for Conferment of the Degree of Doctor of Philosophy in Business Administration (Accounting) of the University of Kabianga

UNIVERSITY OF KABIANGA

OCTOBER, 2019

DECLARATION AND APPROVAL

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This thesis work is my original and has not been presented for the conferment of a degree or for the award of a diploma in this or any other university:

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DEDICATION

To my Father and to the revered memory of my Mother

To my Brothers and Sisters.

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First and foremost, all praise and thanks to Almighty God, the Most Gracious, the most Compassionate, the most Merciful, for according to me the strength to pursue and finish this work.

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May God reward them all!!

ABSTRACT

Unprecedented human-induced climate change has been witnessed, majorly attributed to industrial-related activities that result in depletion of natural resources as well as harmful emissions. This has increased the global concern for the environment, with more stakeholders demand for corporate ecological reporting. However, reviewed studies indicate varying degrees of corporate ecological reporting, with others severely deficient of it. The objectives of the study were to evaluate the moderating effect of financial strength on the relationship between environmental sustainability disclosures and corporate characteristic, ownership structures as well as internal controls. The study was guided by stakeholders, legitimacy and agency theory. It study employed a correlational survey research design on a panel datacovering the period of five (5) years (2013 - 2017). The target population was sixty-five (65) firms listed in NSE, with a sample size was 56 firms, purposively selected. Data used was from firms' annual reports, stand-alone reports, and website, collected using checklist. Analysis of data was done with the aid of Stata using environmental disclosure index, Pearson's correlation, Fixed effect model and. Content analysis was used to attach scores on environmental information disclosures through a checklist developed under the guidance of the Global Reporting Initiatives. The study findings indicated that $R^2 = 0.64$ with board size (β= .01, ρ<.05), institutional ownership β= .05, p<.01), audit committee independence (β= .12, p< .05), board independence (β= .24, p<.05) and board qualifications(β= .07, ρ<.05) having a positive and significant effect onenvirnonmental sustainability disclosure. However, board diversity (β= -.01, ρ<.05) and ownership concentration (β= -.02, ρ<.05) had a negative but significant effect on environmental sustainability disclosure while board meetings had no influence on environmental sustainability disclosure. More findings showed that financial strength strengthenthe relationship between environmental sustainability disclosureand board independence (β = .23, ρ<.01), institutional ownership (β = .14, ρ< .05), and audit committee independence (β = .13, ρ<.01) However, the relationship is weakened with regard to board diversity (β = -.03, ρ<.05), board meetings (β = -.16, ρ<.05), ownership concentration (β = -.01, ρ< .05). The inclusion of the interaction term resulted in an R^2 change of 0.03 (board charcteristics*financial strength), 0.13 (ownership structures*financial strength) and 0.09 (internal controls*financial strength). The study concluded that, overall, financial strength has significant moderating effect on the relationship between corporate governance and environmental sustainability disclosure. It recommends;enactment of policies addressing corporate environmental reporting by firms as a result of different asset base, establishment of corporate environmental committee to spearhead ecological issues, and implementation of mandatory disclosures. Future studies need to focus on; specific dimensions such as directors' experience, age, and nationality, cross-

listing of the board, cross-country comparative analysis, and segment-wise analysis.

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LIST OF ACRONYMS& ABBREVIATIONS

ACCA	Association of Chartered Certified Accountants
ADG	Africa 2063 Development Agenda
BC	Board Characteristics
CDP	Carbon Disclosure Project
CED	Corporate Environmental Disclosures
CEO	Chief Executive Officer
CERES	Coalition for Environmentally Responsible Economies
CMA	Capital Market Authority
CSD	Corporate Social Disclosures
CSR	Corporate Social Responsibility
DV	Dependent Variable
EA	Environmental Accounting
EDAR	Environmental Disclosure on end-year Reports
EDGAR	Electronic Data Gathering, Analysis and Retrieval
EG	Environmental Governance
ESD	Environmental sustainability disclosure
ESG	Environmental, Social and Governance
FIRE	Excellence in Financial Reporting
FS	Financial Strength
GDP	Gross Domestic Product
GHG	Green House Gas
GoK	Government of Kenya
GRI	Global Reporting Initiatives
IAS	International Accounting Standards

IC	Internal Controls
ICPAK	Institute of Certified Public Accountants of Kenya
IFRS	International Financial Reporting Standards
INTOSAI	International Organization of Supreme Audit Institutions
IPCC	Intergovernmental Panel on Climate Change
IPSAS	International Public Sector Accounting Standards
IR	Integrated Reporting
ISA	International Standards on Auditing
ISO	International Standards Organization's
IV	Independent Variable
JICA	Japanese International Cooperation Agency
KASE	Kazakhstan Stock Exchange
KENAO	Kenya National Audit Office
KLD	Kinder, Lydenberg, Domini, Incorporation
NAMEA	New Material Flows Accounting System
NCC	Nairobi City County
NSE	Nairobi Securities Exchange
NSW	New South Wales
OS	Ownership Structures
OECD	Organisation for Economic Co-operation and Development
PFM	Public Finance Management
R & D	Research and Development
SASB	Sustainability Accounting Standards Board
SDGs	Sustainable Development Goals
SDI	Sustainability Disclosure Index

SEC	Social and Environmental Committee
SER	Social and Environmental Reporting
SP	Strategic Planning
SoER	State of the Environment Report
SR	Sustainability Reporting
SSPA	Sector Supplement for Public Agencies
TBL	Tripple Bottom Line
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEA	United Nations Environmental Assembly
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
USA	United States of America
WBCSD	World Business Council for Sustainable Development
WHO	World Health Organization
WRI	World Resources Institute

DEFINITION OF TERMS

Environmental sustainability disclosures refers to entail both quantitative and qualitative reporting by the NSE listed firms in their corporate governance structures environmental related issues that have impact on the natural environment as well as the measures in place for non-environmental degradation through resources commitment.

Financial strength is taken to mean the firm size measured in terms of the asset base. The variable is taken as a general representative of financial strength aspects that act as a moderator towards the outcome of the measured result.

Corporate governance refers to the structures and mechanism of firms' operations, and their effects on the disclosure of environmental information pertaining firm's activities that have an impact on the natural environment. In this study, the term is taken to mean board characteristics, ownership structures, and internal controls.

Board characteristics is taken to beone of the corporate governance variables in NSE listed firms measured in terms of board independence, role duality, size of the board, directors' education qualifications and experience, and board meetings.

The ownership structure is taken to mean one of the corporate governance variables in NSE listed firms measured using the firm industry, ownership and concentration.

Internal controls for this study purpose are taken to be one of the corporate governance variables in NSE listed firms measured using the presence of an auditing committee, corporate environmental committee, and leverage.

Firm size is taken to be the financial strength variable moderator measured using the listed firm's asset base.

CHAPTER ONE

INTRODUCTION

1.1 Overview

This chapter presents the background of the study, statement of the problem, general and specific objectives of the study, research hypothesis, justification of the study, the significance of the study, research scope and limitations of the study.

1.2 Background of the Study

For the past several decades, there has been witnessed global concern for the environment, due to the imminent dangers posed by the overemphasized increased the economy's growth and development at the expense of the environmental sustainability. Unprecedented climatic changes with severe impact on human, marine as well as other ecosystems have been witnessed (Climate change, 2019). To a large extent, this has been attributed to industry-related activities involving use of the raw materials extracted from the environment leading to their exhaustion, release of toxic waste into the environment as a result of manufacturing the raw materials into finished products. These substances have both long term and short term effects on environment (Environmental problems, n.d.).

For a long time, most of the firms have majorly been concerned about profit and wealth maximization, and sluggishly engaging on some social responsibility activities such as philanthropy. More so, little attention has been directed towards the management of environmental-related issues through disclosure. Globally,

there has been witnessed growing pressure as a result of unprecedented climate change as well as environmental degradation health related problems, all of them attributed to firms' activities for firm's responsibility and adherence towards environmental policies and guidelines. On this note, environmental disclosures has started to gain momentum among several firms more especially in developed economies and few emerging economies (Aburaya, 2012; Kathyayini, Carol and Laurence, 2012; Borunda, 2019; Climate Central, 2019).

Several first world countries (such as the United Kingdom, Australia, and United States of America, among others) have made disclosure of environmental information mandatory by firms. However, in third world economies, disclosure by firms is voluntary and patchy, with little driving force to disclose such information. This might have been attributed to unavailability of legislation as well as the quantifiable benefits (Kathyayini, Carol, and Laurence, 2012). Nevertheless, to prevent environmental degradation by firms, mandatory environmental sustainability disclosure is paramount.

The concept of environmental sustainability has been developed from the arrival of the concept of 'Our Common Future' in 1987, The Brundtland Report, and World Business Council for Sustainable Development (WBCSD) that gave a meaning of practical advancement, which has turned out to be a standout amongst the most generally embraced definitions today; 'improvement which addresses the issues of the present without bargaining the capacity of future ages to address their own issues' (World Commission on Environment and Development 1987).

Further, Global Reporting Initiative (GRI), (2011) defines environmental sustainability disclosure as a routine with regards to estimating, revealing and being responsible to inside and outside partners for hierarchical natural execution towards the objectives of reasonable advancement. Environmental sustainability is majorly concerned with the enhancement and conservation of biological and physical characteristics of the earth (United Nations Department of Economic and Social Affairs, 2002). It involves the provision of information in relation to the environmental implications of the firm's operations (Deegan, 2006).

In relation to corporate governance, environmental sustainability disclosure can be termed to be a way of ensuring effective corporate governance which incorporates transparency in its environmental performance, sometimes viewed as "governance by disclosure" (Gupta, 2008). The term governance as clarified by Erhun (2015) constitutes various fields such as "welfare governance, economic governance, and environmental governance". The three governance measures are incorporated under corporate governance. In this study, the emphasis was on environmental sustainability-related corporate governance.

With proper corporate governance structures in place, organization's accountability and transparency is guaranteed through adequate triple bottom line (TBL) disclosure, which entails three measurements namely social, monetary and natural (Elkington, 1997). For corporate governance effectiveness, the concept has been cited as the most appropriate due to its holistic nature of value creation over the short, medium and long term (McFie, 2018). However, Aburaya (2012) observed that despite increased disclosure, the general corporate disclosure and

more especially corporate environmental disclosure continues to be among the "biggest challenges" affecting implementation of corporate governance.

One of the most devastating environmental concerns by a firm's activities in Kenya was the massive health problems suffered by Mombasa County residents in Kenya, resulting from leadbattery recycling factory adjacent to Owino Uhuru slum. The factory was emitting poisonous gas, effluents and other physical exposure (Okeyo and Wangila, 2012). It led to various lead poisoning related diseases and deaths, with 2018 laboratory test results indicating three out of 18 residents having high lead levels in their blood (Mwakio, 2018).

Conventional reporting together with the international accounting standards (Aburaya, 2012; Samuels, 1990) have not addressed environmental issues, but only embarking in lengthy on economic factors against social and environmental concerns, thus necessitating environmental sustainability disclosures (Saravanamuthu, 2004).

The financial strength, in form of firm size has varied effects on the business such as patronage, goodwill, customer loyalty and responsiveness towards its stakeholders. Previous research have indicated the connection between firm size with corporate social responsibility (Anazonwu, Egbunike, and Gunardi, 2018; Habbash, 2016; Khan, 2010), as bigger companies tend to be more salient, therefore, tend to attract more attention from the stakeholders, whomay compel them to appear good (Hyun, Yang, Jung, and Hong, 2016).Small firms as asserted by Obigbemi, Iyoha and Ojeka (2015) in most cases do not publish their end year

reports and when they do so, is as a result of the statutory requirements. On the other hand, large firms due to their expansive shareholders base as well as their diverse background, they are compelled to disclose all the requisite information in order to not only retain but also enhance its reputation, investment and attract other prospective investors to the firm.

Previous studies have indicated that big firms even though they are endowed with more resources as well as earning higher profits (Swastika, 2013), normally adopt discretionary reporting frequently as compared to the smaller firms (Barako, 2006; Khodadaki, Khazami, and Aflatooni, 2010). In concurrence to this isSwastika (2013) who noted that large firms are more likely to avoid environmental disclosures through voluntary reporting. This propels the need to examine the effect firm size has on the association between corporate governance and environmental sustainability disclosures.

1.2.1 Sustainability Reporting by the Corporate Sector Listed Firms

Listedfirms at the Nairobi securities exchange are regulated by the Capital Markets Authority, through Capital Markets AuthorityAct, 2002 (cap. 485a) of the laws of Kenya. The Capital Market Act institutional framework endeavor to propagate three vital undertakings; First, is to ensure the presence of an effective organ meant for proper governance. This is different and autonomous of management, for the purpose of advancing accountability, efficiency and effectiveness, probity and integrity, accountability together with transparency. In addition, a proper leadership coupled with correct and real-time information disclosure pertaining all firm's activities are paramount (Bokpin, Isshaq and

Nyarko, 2015). Second, it is necessary to have all-around governance measures that acknowledge and take care of the members' rights as well as all other stakeholders. Third, the governance framework needs to ensure of an enabled ecology where its labour force can comfortably contribute as well as bring to bear their innovative powers in relation to looking for creative answers towards common problems.

The study applied both the Global Reporting Initiative (GRI) framework and traditional reporting framework. The traditional reporting framework was preferredto Integrated Reporting (IR), which though its first publication was in the year 2013, adoption and effectiveness in the year 2014, its market test between 2014 and 2017 had only six listed firms (namely: Safaricom ltd, Kenya Commercial Bank (KCB) ltd, Equity Bank ltd, Cooperative Bank Ltd, Standard Chartered Bank Ltd and Barclays Bank Ltd) having fully adopted it (Integrated Reporting, 2017; ICPAK, 2017).

Nairobi Securities Exchange (NSE) has partnered with ICPAK, Capital Market Authority (CMA) Kenya, and the PSASB in coming up with Excellence in Financial Reporting (FIRE) award. The primary objective is strengthening the financial markets and assist firms to attract investment, as well as allowing business entities to make disclosure of their activities which has enabled a wide range of stakeholders to use such information in making economic decisions. The award is premised on three key objectives: Promotion of financial reporting excellence; Fostering of sound corporate governance practices; and enhancing corporate social investment and environmental sustainability reporting.

Among the firms listed at the NSE, several of them have been suspended while others delisted as a result of engagement in corporate governance malpractices. For example, the suspended firms by the month of March 2019 include; Kenol Kobil Limited, Deacons Limited, Athi River Mining (ARM) Limited and Atlas Africa Industries Limited. The three delisted firms include; Marshall East Africa Limited, Hutchings Biemer Limited and A. Baumann Limited. Further, out of the currently 65 listed firms, some are on the watch list of the Capital Market Authority (CMA) due for delisting as a result of poor performance and corporate governance challenges. They include; Uchumi Supermarkets, Mumias Sugar Company, Kenya Power, National Bank, TransCentury, Express Kenya, Sameer Africa Plc, East African Cables Limited, Olympia Capital Holdings Limited Home Afrika Limited and Eveready East Africa.

Business engagement and disclosure of social and environmental practices are mostly discretionary in nature in many developing as well as other developed economies resulting to a 'love-hate' relationship (Mahmood and Orazalin, 2017). Environmental sustainability disclosureas a vital emerging field and with the increasing public outcry over the natural environment, its corporate disclosure worldwide has greatly gone up over the last few decades (Janggu, Darus, Zain and Sawani, 2014; Giannarakis, 2014; Aburaya, 2012; Ioannou and Serafeim, 2012; Kolk and Pinkse, 2010; O'Donovan and Gibson, 2007).

In emerging economies, however, Ben-Amar, ChangandMcIlkenny, (2017), Yunus, Evangeline and Abhayawansa, (2016), Liao, Luo and Tang, (2014) observed little attention directed towards environmental sustainability disclosures

by corporate bodies. The rate of ecological degradation is becoming worse day by day (Ofoegbu andMegbuluba, 2016; Omofonmwan and Osadah, 2008).This is despite the legal support as well as funding, which various environmental-related institutions enjoy both from the government and other non-governmental organizations, resulting in a far cry success from her set goals. Oludayo (2012) attributed this towards failure by the regulatory authorities in designing proper practices which provide effective as well as efficient enforced and complied with global and country ecological laws.

In Kenya, several corporate environmental sustainability disclosure studies have given a lot of attention on corporate characteristics (such as firm size, market capitalization, profitability, industry affiliation, leverage and systematic risk) (Musyoka, 2017; Bett and Tibbs, 2017; Gatimbu and Wabwire, 2016; Chepkwony, 2015; Kipkorir, 2015; Mutiva, 2015; Ngatia, 2014; Musiega, Juma, Alala, Okaka and Douglas, 2013; Barako, Hancock and Izan, 2006). However, few prior studies have evaluated the relationships between corporate governance systems and environmental sustainability disclosures (Aburaya, 2012; Adams, 2002). For instance, Wachira (2017) examined the determinants of corporate social disclosures with respect to corporate governance. However, the study extensively looked at corporate characteristics with little attention directed to corporate governance mechanisms.

The study looked at the moderating effect of financial strength of a firm on the association between corporate governance and environmental sustainability disclosures. Corporate governance as a predictor variable was measured using

three variables namely: board characteristics, internal controls, and ownership structures. Board characteristics measures entail; board of directors' composition, qualifications and age. Internal controls were measured by committees present (such as responsibility, audit, and environmental committee), and debt level. The ownership structure is measured by security ownership (blockholder, managerial, and government). Corporate governance system coupled with environmental sustainability information disclosures has a great significance for instance on emerging economies it helps towards attracting foreign investment, through cross-border share ownership(Bopkin, Isshaq and Nyarko, 2015).

1.3 Statement of the Problem

Ecological conservation is paramount towards growth and development of an economy. Globally, there has been witnessed unprecedented human-induced climate change, with statistics for instance showing that over the last 139 years, the top five warmest years being 2014, 2015, 2016, 2017, and 2018, with 2017 being the hottest and 2018 the fourth hottest (Borunda, 2019; Climate Central, 2019). The consistently growing climate change has been majorly attributed to industrial-related activities that result in depletion of natural resources and harmful emissions. This has increased the environmental global concern, with more stakeholders demand for corporate ecological responsibility. The decision as to which firm, when, how, what and to what extent to disclose the ecological matters rest upon an entity's corporate governance mechanism (Agyei-Mensah, 2016). Past studies indicate varying degrees of corporate ecological reporting, with many severely deficient of it. The disclosure disharmony could probably be

associated to the weak governance structures in various firms, as well limited resources endownment. What remains unclear is the relationship between corporate governance and ecological sustainability disclosures withfinancial strength moderating effect. Studies in first and third world countries have evidenced corporate governance impact on ecological exposure (Umoren,Udo, and George, 2015).However, the disclosure, being an emerging aspect in Kenya, little is known about the relationship between corporate governance and environmental sustainability disclosure by the listed firms, more so with the dispensation of the new integrated reporting framework in the year 2013. The questions that continue to seek answers are: if corporate entities disclose their impact on the ecology,how does corporate governance influence the degree of ecological disclosure by firm? Further, what is the impact of corporate attribute on corporate ecological governance? Given the foregoing, the purpose of the study was to examine the moderating effect of financial strength on the relationship between corporate governance and environmental sustainability disclosure among the public listed firms in Kenya. The results of the study are meant to benefit; research scholars, listed firms, government and non governmental bodies in policy formulation.

1.4 Purpose of the Study

The purpose of the study was to examine the moderating effect of financial strength on the relationship between corporate governance and environmental sustainability disclosure among the NSE listed firms in Kenya.

1.5 Specific Objectives

Specifically, the study sought to;

i. Determine the relationship between board characteristics and environmental sustainability disclosure among the listed NSE firms in Kenya.

ii. Evaluate the relationship between ownership structure and environmental sustainability disclosure among the listed NSE firms in Kenya.

iii. Assess the relationship between internal controls and environmental sustainability disclosure among the listed NSE firms in Kenya.

iv. Determine the moderating effect of financial strength on the relationship between corporate governance and environmental sustainability disclosure among the listed NSE firms in Kenya.

1.6 Research Hypotheses

The following hypotheses were tested;

$H_0$1 There is no significant relationship between board characteristics and environmental sustainability disclosure among the listed NSE firms in Kenya.

$H_0$2 There is no significant relationship between ownership structure and environmental sustainability disclosure among the listed NSE firms in Kenya.

$H_0$3 There is no significant relationship between internal controls and environmental sustainability disclosure among the listed NSE firms in Kenya.

H_04 There is no significant moderating effect of financial strength on the relationship between corporate governance and environmental sustainability disclosure among the listed NSE firms in Kenya.

1.7 Justification of the Study

Corporate governance has been hailed as the solution to the various corporate management failures recently witnessed on corporate bodies such as environmental degradation challenges. Increased pressure on environmental management has been witnessed by various stakeholders. This is amidst rising cases of corporate scandals which have to an extent resulted in total or near-collapse of several companies. Further, as part of corporate governance mechanism, various environmental policies have been established to guide on firm's management and reporting of environmental issues, in line with corporate environmental governance. However, despite the reporting requirements, not all firms disclose their environmental aspects in their published reports, with some providing full disclosure, others providing marginal disclosure, while others do not disclose at all. This has therefore triggered an interest to understand more on whether the disclosure of firm's environmental sustainability informationthrough corporate governance mechanisms is influenced by the firm's financial strength (measured by the firm asset base).

1.8 Significance of the Study

This study was significant for various reasons. First, this is because it is a new area of research and the pioneer of its nature on the impact of firm's financial

strength towards the association between corporate sector governance and environmental sustainability disclosure quantity as well as quality assessment. This is in line with the international financial reporting standards framework. It helps to understand the level of importance attached to the ecological issues in corporate governance mechanisms as evidenced by the resources committed towards ecological management. Value determination, as well as measurement, is extremely important and worthy of prudent attention and through addressing this, the researcher contends it as a vital step towards advancement of disclosure research(Aburaya, 2012; Botosan, 2004).

It will extent new knowledge on the moderating capability of financial strength on the relationship between CG and ESD. To the accounting profession, professional bodies such as ICPAK, PSASB, CMA, Institute of Internal Auditors (IIA) are going to benefit in policy formulations especially onenvironmental issues, for example, the need for establishment of corporate environmental committee CEC and application of mandatory reporting (IR).Further, it may inform any future endeavours such as guide Kenyan CED practices towards embedding and integrating such guidance within firms' CG structures.

On the listed firms, it may help them to appreciate the value of ESD in corporate management. To the Government and other non-governmental bodies, policy adherence towards ESD by firms may be formulated as well as on the appropriateness of reporting guidelines. It will as well add value to the on-going debate and literature on Corporate Environmental Disclosure as one of the emerging issue among firms.

Through the asset base of each firm, allocation, management, as well as disclosure of environmental funds together with the related environmental activities, determined the level of firm's commitment towards achievement of SDGs. For example, by minimizing the pollutants emission levels, the firm was working towards achievement of SDG number three (ensuring healthy lives and promoting well-being for all), treatment of effluents discharge and through this the firm contributes towards realization of SDG number six (ensure availability and sustainable management of water and sanitation for all**).**

The study was meant to help establish through the moderator effect on the relationship between board characteristics and ESD, for example, the composition of the board of directors which in effect help to ensure gender representation. This helps towards fostering the realization of SDGs such as goal number five on achieving gender equality by empowering women and girls (UNDP, 2015).

The study findings were also to help in determining the contribution of the firms towards mitigation of climate change action through the environmental issues, resources allocation as well as policies put in place on ways of packaging its products in order to minimize on unrecyclable packaging products trash released to the environment. For example, the plastic paper bags whose production, trading and carriage have been banned in Kenya with effect from August 2017 (The Kenya Gazette, 2017). Further, a ban was issued by the National Environmental Management Authority (NEMA) on the manufacture and usage of non-woven polypropylene bags, with effect from 31st March 2019, meant to have replaced plastic bags, due to their poor quality. Their single-use due to poor quality

eventually leads to heavy environmental consequences (National Environment Management Authority, 2019). This trash finally lands to the water bodies such as dams, lakes, seas and oceans endangering the marine life and coastal diversity. Through the study results, evaluation of SDGs implementation was measured such as number fourteen (conserving and sustainably using the oceans, seas and marine resources for sustainable development (UNDP, 2015).

Finally, environmental reporting potentially serve as a tool for strategic planning and policy analysis by both the national and county governments towards identifying the implications of different regulations, taxes, and consumption patterns on environmental sustainability as well as paths to the sustainable development of specific economic activities.

1.9 Scope of the Study

The study was carried out on all NSE listed firms in Kenya as of May 2018. These firms trade their securities at the NSE market and therefore are publicly owned, and have been bestowed with the responsibility of safeguarding their wide stakeholders' interest especially through instituting sound corporate governance mechanisms that ensure their environmental concerns are properly addressed through corporate environmental disclosure. The study population was the entire sixty-five (65) listed firms at the NSE (NSE Handbook, 2018; Cheruiyot, 2017). However, based on the availability of disclosure information by the firms,

The study was guided by the Global Reporting Initiatives (GRI) guidelines on sustainability disclosures, Capital Market Authority (CMA) and International

Financial Reporting Standards (IFRS) for the corporate sector entities reporting. With a longitudinal horizon, the research adopted a correlational survey research design on a panel data and thus all limitations of survey research applied.The study period was from 2013 to 2017.

1.10 Limitations of the study

The study was based on NSE listedfirms in Kenyan set-up and therefore, its findings might not be applicable in other settings outside Kenya if different environmental settings exist due to its single-country focus. The research design employed was the correlational survey design, applied on a panel data over a period of 5 years (2013 – 2017). The study population was all the 65 listed firms at the NSE (NSE Handbook, 2018; Cheruiyot, 2018). Purposive sampling was applied in determining the sample size, where only those firms that disclose environmental-related data in their reports was selected while those that do not disclose was eliminated from the sample.

Inferential statistics and content analysis were applied in data analysis. Data collection method involved the use of secondary data, that include firm's annual reports, sustainability stand-alone reports, environmental-related reports disclosed on the company's website and newsletters. Inferential statistics were used in statistical data analysis (through regression model) while a disclosure index (Environmental Disclosure Index (EDI)) was used in content data analysis.

1.11 Assumptions of the study

As Leedy and Ormrod (2010) posited, "Assumptions are so basic that, without them, the research problem itself could not exist", the study was premised on several assumptions. First, ecological management will continue be an important aspect towards any firm's corporate governance practices. Second, financial strength as one of the corporate governance attributes, plays a paramount role towards corporate ecological disclosure practices. On the secondary data used, it was assumed that they were accurately prepared in line with the set standards and they presented a true and fair view of the firms' financial and non-financial position as and when reported. On the sample size selected of 56 firms, it was assumed to be a representative of the study population made inferences to.Data collection instruments were assumed to be reliable through pilot testing and inter-coder reliability testing. Further, the instruments were assumed to be valid by conducting a construct and content validity.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter reviewsthe literature on corporate governance and environmental sustainability disclosures on all listed firms at the NSE. Both theoretical and empirical literature has been exclusively reviewed so as to establish what has been done, the extent, how it was done, and when it was done in identifying research gaps that basis the study.

2.2 Corporate Governance and Environmental Sustainability Disclosure

Severe global human-induced climate change has been witnessed recently, with firm's emissions contributing immensely. Worse off are the recent corporate scandals that have ravaged several firms, awakening several numbers of studies regarding how firms are governed as well as report on climate-related activities (Ofoegbu, Odoemelam, and Okafor, 2018). However, it remains discretionary for firms to disclose their ecological effect (Plumlee, Brown, Hayes and Marshall, 2015), with the information severely deficient in various firms reports (Al-Janadi, Rahman and Omar, 2012) and even where it is contemporaneous, firms only report it shallowly. The decision as to which firm, when, how, what and to what extent to disclose these ecological matters rest upon an entity's corporate governance mechanism (Mayorga and Trotman, 2016; Agyei-Mensah, 2016), in addition to the firm attributes such as asset base, and profitability (Ahmad, Osazuwa and Mgbame, 2015).

Despite corporate governance being hailed as a solution for corporate ecological failures, little is evidenced by the extant literature as to its value creation on ecological sustainability disclosures. This is coupled with disclosure variances from corporate attributes. Corporate environmental disclosure in the past few decades has been an important area of focus more especially with the continued unprecedented global environmental degradation attributed to industrial activities that are harmful to the natural environment. Corporate ecological disclosure is intended at provision of vital and faithful information on an entity's operations in ecology (Bateman, Blanco and Sheffi, 2017; Odoemelam and Okafor, 2018). This information is captured in some traditional end-year reports and in the all-in-one-integrated annual report (de Villiers, Venter and Hsiao, 2017). Environmental sustainability disclosure has gained momentum from several corporations with most of them looking at the level of environmental sustainability disclosures on the firm's and year reports (mostly annual reports), as well as its association with the corporate characteristics in terms of profitability, liquidity, debt level, systematic risks involved, and industrial sector among others(Gray, Javad, Power and Sinclair, 2001).

However, from the several prior studies carried out, little has been done with regard to corporate governance reporting practices and corporate environmental sustainability disclosures with very little research carried out on the Kenyan corporate world, for both quantitative and qualitative research. Several studies on the relationship between corporate governance and environmental sustainability disclosures have delved more into corporate characteristic reporting and thus

leaving a gap in corporate governance structures disclosure. A considerable body of literature from varied theoretical underpinnings has acknowledged that sustainable environmental disclosure is guaranteed on a good corporate governance environment (Aburaya, 2012; Cormier, Ledoux and Magnan, 2011; Peter and Romi, 2011; Dunstan, 2008; Gul and Leung, 2004).

With the ending of the Economic Recovery Strategy, vision 2030 (Kenya's national development agenda) is intended to foster "a globally competitive and prosperous country with a high quality of life by 2030" through transformation to a "newly industrialized, middle-income country providing a high quality of life to all its citizens in a clean and secure environment". Its main agenda is geared towards the achievement of an economy entrenched in a hygienic, safe as well as "sustainable environment" steered through the standards of sustainable development (UN, 2012). Whether private or public institution, adequate corporate governance policy frameworks are vital for sustained growth. Osabuohien, Efobi and Gitau, (2013), Osabuohien, Efobi, and Ciliaka, (2015) alleged that African countries are lagging behind in taking steps to protect their environment due to weak institutional corporate governance framework.

As Isaksson and Steimle (2009) alluded, different proposals and rules for sustainability disclosure have been made available in late years. Probably the most conspicuous and widely utilized are the Global Reporting Initiative (GRI) Rules, established in 1997 by the Coalition for Environmentally Responsible Economies (CERES) and the United Nations Environmental Programme (UNEP). The GRI Rules were at first disclosed in 200. Their goal is to help organizations

in developing sustainability reports that incorporate social, natural and financial effects of business. The rules require standard substance for sustainability disclosure regarding the entity's profile, its administrative structures and forms, and the administration of sustainability issues including objectives and ecological, social and monetary execution markers.

In order for the firms to meet the set guidelines, they need a definite and complex examination of the institution's engagement with ecological frameworks, assets, environments, and social orders, and decipher this in the light of every other entity' over a significant time span impacts on those same frameworks. Corporate governance and sustainable development go hand in hand, thus in order to exercise and achieve good governance, sustainability reporting cannot be wished away(Gray and Milne, 2002). CGhas been laid on the platform of national development agenda (Kenya vision 2030), Africa 2063 development agenda, and the newly adopted 2015 Sustainable Development Goals (SDGs).

Governance is one of several factors that can be instrumental in strengthening implementation of sustainable development policies which is a challenging task (Ban Ki-Moon, 2016). By this it implies that efficient and effective resources generation and utilization must be the responsibility of every firm in order to continuously implement them, as with Heijden and Bapna (2015) objectives are intended to be the bread for everyday execution, not cake for exceptional events. Under the seventh National Development Plan of 1994-1996, titled 'Resource Mobilization for Sustainable Development' the state has unmistakably laid out an arrangement on requirement for conservation of a clean ecology and the

contribution of the private as well as open segment for sustainable improvement (UN, 2012).

The negative effects of advancement are presently clear in the expanding debasement of the ecology and shortage of natural assets saves in the emerging economies. Sustainable development goals should be connected and driven at the village level if at all it is to be achieved. Sustainable development has become a gargantuan monster and tackling it requires concerted efforts through long-term policies and coordinated actions. Despite the activities of private sector industries on global environmental issues have received global attention, there is more than meets the eye with regard to corporate environmental disclosures through governance (Osabuohien *et al.*,2015).

Due to enormous resources needed to implement the agendas, transparency and accountability are essential at all levels of corporate governance as noted by the report on funding and implementation of SDGs (United Nations Non-Governmental Liaison Service, 2013). Transforming the 17 SDGs into reality before 2030 deadline was a standout amongst the most aggressive endeavors the worldwide community has ever taken (Nabarro, 2016). In this regard, inclusive participation of all society is important with no one being left behind. The scope of the study was based on environmental sustainability disclosure with regard to corporate governance and financial performance.

Data has shown that for any institution good governance to be in place, there has to be accountability on resources utilization which implies appropriate and

comprehensive reporting(UNEP, 2014). In order for the economy to achieve the real sustainable development as stipulated in the National Development Agenda (Kenya Vision 2030), Africa 2063 Development Agenda, and global Sustainable Development Goals (SDGs), financial accountability is of prime necessity. As observed by Achim Steiner (2014), good governance and sustainable financial reporting mechanisms are the building blocks for an inclusive Green Economy. Changes from regular disclosure conventions and ways to deal with contemporary natural sustainability disclosure approaches rose in the 1990s (Senge, 1993; Epstein, 1996) where words, for example, 'full', 'add up to', 'genuine' and 'life cycle' are frequently utilized as a part of ecological disclosure habits to accentuate the significance of a more extensive sustainability data scope in institutional decision making on governance.

One of the enormous challenges that could face many firms in their environmental sustainability reporting for sustainable development through appropriate organizational governance measures is for example by demonstrating they are both lessening their aggregate effects on the ecology (a most impossible result when they are looking for growth, development and improvement) as well as ensuring quality products and services to their stakeholders that are environmental compliant - again a most improbable result for a fruitful industrialist economy (Gray and Milne, 2002).

In Kenya, the government through National Environmental Management Authority (NEMA) has developed a programme where environmental experts are engaged towards advising companies on efficient use of raw materials as well as

other resources, geared towards pollution reduction. This is made possible through working step by step with firms towards enforcement of environmental standards in an easier and friendly manner. For example, the World Bank granted Kshs. 90 million to lake Victoria basin meant towards the adoption of cleaner production measures, and as a result, they are saving up to Kshs. 1 billion a year through cost-effective production methods.

Through NEMA and cleaner production centre, consideration was being weighed with regard to firms to participate in the Nairobi River (the most polluted river in Kenya) protection project. To achieve this, firms are expected to commit through enrolling on measures intended to reduce effluents emissions into the river resulting in Kshs 430 million savings, with the listed firms targeted being East African Portland Cement (EAPC), British American Tobacco (BAT), East African Breweries Limited (EABL) and Bamburi cement (Siringi, 2014). GRI (2013) states that sustainability reporting by any organization should be guided by the following principles which define the report content:

Stakeholder Inclusiveness Principle: The organization should identify its stakeholders, and explain how it has responded to their reasonable expectations and interests. Sustainability Context Principle: The report should present the organization's performance in the wider context of sustainability. Materiality Principle: The report should cover Aspects that; reflect the organization's significant economic, environmental and social impacts; or substantively influence the assessments and decisions of stakeholders. Completeness Principle: The report should include coverage of material Aspects and their Boundaries,

sufficient to reflect significant economic, environmental and social impacts, and to enable stakeholders to assess the organization's performance in the reporting period.

Balance Principle: The report should reflect the positive and negative aspects of the organization's performance to enable a reasoned assessment of overall performance. Comparability Principle: The organization should select, compile and report information consistently. The reported information should be presented in a manner that enables stakeholders to analyze changes in the organization's performance over time, and that could support analysis relative to other organizations. Accuracy Principle: The reported information should be sufficiently accurate and detailed for stakeholders to assess the organization's performance. Timeliness Principle: The organization should report on a regular schedule so that information is available in time for stakeholders to make informed decisions. Clarity Principle: The organization should make information available in a manner that is understandable and accessible to stakeholders using the report. Reliability Principle: The organization should gather, record, compile, analyze and disclose information and processes used in the preparation of a report in a way that they can be subject to examination and that establishes the quality and materiality of the information.

Kenya has ratified most of the international agreements, treaties, conventions, and protocols resulting from the first Rio conference, that are considered to be in harmony with the country's plans for sustainable development(UN, 2012). In addition, as a clear demonstration of its commitment, she has been a host to

several United Nations meeting of the Parties to the Kyoto Protocol (CMP 2), such as the twelfth session of the Conference of the Parties to the UNFCCC (COP 12), held in Nairobi City County from 6th to 17th November 2006, the UNCTAD 14 from 17 to 22 July 2016 that was heavily mirroring on global sustainable trade through actions, and the annual United Nations Environmental Assembly (UNEA) under the theme 'One Planet Summit 2019', held from 14th to 15th March 2019 at the UNEP headquarters in Nairobi, Kenya. It was meant to reaffirm the world's commitment to the fight against climate change (World Bank, 2019).

Corporate Governance

Corporate governance is a mechanism designed to ensure the protection of the business owner and other stakeholders interests (Widyaningsih, Gunardi, Rossi and Rahmawati, 2017; Honggowati, Rahmawati, Aryani and Probohudono, 2017). The definition of corporate governance (CG) however differs based on one's view of the world. Corporate governance basically consists of proper mechanisms that allow stakeholders to exercise control over management and it's aimed to create an optimum balance among various economic, individual and social goals as well as increase transparency (Sharif and Rashid, 2014).

The term governance has been subjected to many changes, with the narrow concept of CG considering it as a system created towards ensuring running of the entity in the best possible interest of the shareholders, while having little attention on the entity's socio-environmental obligations (Garas and Elmassah, 2018; Jamali, Safieddine and Rabbath, 2008). This partial view has however been

challenged overtime with a broadened perspective that considers CG as a mechanism meant to ensure entities are operating in a manner that upholds efficient and effective use of the societal resources. Firms have both internal and external systems (Pintea, 2015; Roe, 2008)

The internal CG system advocates for honesty and transparency of information disclosure in a timely manner to all stakeholders. The external CG system addresses the legal system that provides protection towards stakeholder's rights (Garas and Elmassah, 2018; Jamali *et al.*, 2008). Not long ago, the definition of CG has been broadened, emphasizing the significant influence of governance practices towards ecological, social and economic development. Further, the recently witnessed growth of corporate scandals has aroused the call towards implementation of various CG mechanisms in different sections of the globe with a variant level of success (Krechovská and Procházcová, 2014; Marsiglia and Falautano, 2005).

Corporate governance is involved with how lawful and arrangement choices are made, with specific accentuation on the participation of the individuals who are in this manner be coordinated by the result of such choices. Also, it entails ownership, management and control of an entity's structures, processes, cultures and systems that are bent on ensuring successful operations of an organization (Keasey, Thompson, and Wright, 2005). For any entity to thrive in its operations, good governance practices are ineviTable in the current global world. Some of the indispensable indicators of good governance practices are espoused by Cadbury

Report (1992), Cochran and Warwick (1988), Combined Code of Corporate Governance (2003), OECD (2005a), UNCTAD (2006).

As argued by Erhun (2015), CG constitutes various fields such as corporate governance, welfare governance, economic governance and environmental governance. In this study, the emphasis was on environmental sustainability-related corporate governance. With proper corporate governance structures in place, organization's accountability and transparency are guaranteed through adequate triple bottom line disclosure. However, Aburaya (2012) observed that despite increased disclosure, the general corporate disclosure and more especially corporate environmental disclosure continues to be among the "biggest challenges" affecting implementation of corporate governance. This is despite the fact that well-governed entities make more frequent integrated reporting to the stakeholders (Trireksani and Djajadikerta, 2016; Akbas, 2016; Ntim, 2016; Liao *et al.,* 2014; Cormier, Lapointe-Antunes and Magnan, 2015; Marcia, Maroun and Callaghan, 2015; Alhazaimeh, Palaniappan and Almsafir, 2014; Elsakit and Worthington, 2014; Dembo and Rasaratnam, 2014; Iatridis, 2013).

Corporategovernance has come into limelight in early 1990's as a result of several factors majorly various corporate scandals that have befallen well repuTable firms, eventually leading to their total collapse such as Enron Corporation, WorldCom, Pacific Gas and Electric Company, Long-Term Capital Management, Lincoln Savings and Loan Association, Texaco, Allied Crude Vegetable Oil Refining Corp, Chiquita Brands International, Kmart, Adelphia Communications, Arthur Andersen, Bear Stearns, Lehman Brothers, AIG Insurance, BCCI, and

Washington Mutual in the United States, HIH Insurance Limited, Dick Smith Retailer, and Bankwest in Australia, Banco Espirito Santo in Portugal, Anglo Irish Bank in Ireland, Parmalat in Europe, Coloroll, Polly Peck, and Barings in the United Kingdom (Keasey *et al.*,2005; Johnson,BooneandFriedman, 2000; Becht, Bolton and Roell, 2003).

As a result, tougher regulations, codes and corporate governance measures were instituted towards responding to the massive scandals that were endangering the firm's stakeholders interest due to management crises (Mallin, 2011; Aras and Crowther, 2008; O'Sullivan, Percy and Stewart, 2008; Bury and Leblanc, 2007; Mallin, Mullineux and Wihlborg, 2005). In Kenya, several numbers of firms have been involved in corporate scandals that led them being declared bankrupt such as Blue Shield insurance, Dubai Bank, Imperial Bank, and Chase Bank. Others still in operations include Kenya Airways, Uchumi Supermarkets, National Bank, Mumias Sugar Company, Eveready, Athi River Mining (ARM) and CMC Holdings (Mpiana, 2017).

Other listed firms that have been embroiled in corporate governance issues includes electricity supplying Kenya Power Company where millions of taxpayers' money is alleged to have been lost through fraudulent transactions, financial institutions that were alleged to be involved in national youth service Kshs 9 billion scandal such as Kenya Commercial Bank (KCB), Equity Bank, Co-operative Bank, CFC Stanbic Bank, Consolidated Bank, Barclays Bank, Standard Chartered Bank, Diamond Trust Bank, and National Bank (Kamau and Kubania, 2018; Alushula, 2018). British American Tobacco (BAT) Kenya was also hit by a

major corporate scandal in 2015 whereby its staff colluded with the tax authority's staff with the intention to intimidate and tarnish the image of a homegrown company (Mastermind company) by making unsubstantiated numerous tax demands (Herbling, 2015). The near and total collapse has been attributed to unsound firm's governance system.

Kenya, being an affiliate of United Nations, has signed agreement, committing herself towards protection of environment through implementation of various covenants such as 2015 globally accepted Sustainable Development Goals (SDGs), Africa 2063 Development Agenda (ADG), and National Development Agenda (vision 2030). Over the last few decades, the country has been facing numerous environmental-related challenges, some of them attributed to the firm's operations such depletion of natural resources through firms' extraction of raw materials, manufacturing of finished products resulting in harmful and uncontrolled emissions that leads to depletion of the ozone layer. In addition, use of packaging materials that are not biodegradable such as plastic items as well as release of contaminated, highly poisonous untreated industrial effluents into the river, resulting in water pollution which in effect leads to degradation of aquatic ecosystems. Furthermore, there is soil pollution as well as air pollution.

Recently, the Kenyan government has come up with corporate governance legislative policies to ensure the activities of the firms do not result in environmental degradation. Also, there has been increased awareness of the society, who forms part of the firm's stakeholders on the importance of protecting the natural environment that has been severely damaged. This has in effect

increased pressure on the firms to be environmentally sensitive through compliance with the relevant policies and generally accepted best operations practices. For example, through a notice on 28thFebruary 2017(The Kenya Gazette, 2017), the Kenyan government through the ministry of environment and natural resources issued a five months' notice to all manufacturers, wholesalers, retailers as well as consumers of its decision to ban production as well as use of the plastic bags with effect from 28th August 2017.

The purpose was meant to protect the continued environmental degradation that had posed a serious risk to the aquatic, terrestrial, land and onshore life. The implementation of the ban has been successful with Watts (2018) reporting it to be "the world's most toughest plastic bag ban working" as it "comes with world's stiffest fines" such as four years imprisonment or Kenya shilling 4 million ($ 40,000) for anyone manufacturing, selling or even just carrying a plastic bag.

The government in conjunction with other non-governmental environmental bodies has placed a lot of emphasis on firms' adherence to environmental protection. On the other hand, many firms have implemented the already laid out as well as established more policies, exercised in their corporate governance structures, meant to curb environmental degradation. This in effect has necessitated commitment of funds to facilitate the implementation process.

2.2.1 Hypotheses Development

Environmentalsustainability disclosure is a sophisticated phenomenon which could be triggered by varied factors. The current study evaluated various

attributes of corporate governance and financial strength as possible determinants of environmental sustainability disclosure. Benchmarking with the previous studies, the study intends to delve on "identifiable and measurable" corporate governance characteristics in trying to argue the degree of environmental sustainability disclosure, effects of the firm's financial strength on the relationship between corporate governance and ESD. To achieve this purpose, corporate governance structures were measured using three aspects: 1. Board characteristics: board size, directors' experience and qualifications, role duality, and board meetings; 2. Ownership structures: institutional ownership and ownership concentration; 3. Internal controls: audit committee and corporate environmental responsibility (CER) committee. These are further discussed in details as follows as well as in appendix XII.

2.2.1.1 Board Characteristics and Environmental Sustainability Disclosure

The board of directors is responsible for the management of any information reporting in a firm's end year reports. They play a paramount role towards corporate governance mechanisms which by extension may be linked directly with firm's ecological phenomenon(Aburaya, 2012; Bhagat and Bolton, 2008).

The board characteristics examined were directors' experience and qualifications, board diversity, board independence and board meetings. Accordingly, the following hypotheses were derived:

H_{01a} : *There is no significant relationship between the environmental sustainability disclosure and directors independence*

H_{01b} : *There is no significant relationship between the environmental sustainability disclosure and board diversity*

H_{01c} : *There is no significant relationship between the environmental sustainability disclosure and board qualifications*

H_{01d} : *There is no significant relationship between the environmental sustainability disclosure and board meetings*

H_{01e} : *There is no significant moderating effect of financial strength on the relationship between the environmental sustainability disclosure and board characteristics*

2.2.1.2 Ownership Structures and Environmental Sustainability Disclosure

Variance in the ownership structure of an entity can have a significant effect on firm's governance and therefore impacting on the degree of corporate environmental reporting. Ownership components, as well as the ownership method, have been found to possess significant role in disclosing the changes in environmental sustainability reporting behaviours. The ownership structures evaluated in the current study was institutional ownership and ownership concentration. Accordingly, the following hypotheses were derived:

H_{02a} : *There is no significant relationship between the environmental sustainability disclosure and ownership concentration*

H_{02b} : *There is no significant relationship between the environmental sustainability disclosure and institutional ownership*

H_{02c} : *There is no significant moderating effect of financial strength on the relationship between the environmental sustainability disclosure and ownership structure*

2.2.1.3 Internal Controls and Environmental Sustainability Disclosure

Proper systems of internal controls have been associated with value creation towards environmental sustainability disclosures. There has been witnessed pressure from various stakeholders demanding for an adequate internal control system that is an all-round (economically, socially and ecologically sensitive). The internal controls measures applied in the current study were the audit committee independence and number of the audit committee meetings in a year. Therefore, the following hypotheses were derived:

H_{03a} : *There is no significant relationship between the environmental sustainability disclosure and audit committee meetings*

H_{03b} : *There is no significant relationship between the environmental sustainability disclosure and audit committee independence*

H_{03c} : *There is no significant moderating effect of financial strength on the relationship between the environmental sustainability disclosure and internal controls*

2.2.2 Financial Strength

The financial strength, in form of firm size has varied effects on the business such as patronage, goodwill, customer loyalty and responsiveness towards its

stakeholders. Previous research have indicated the connection between firm size with corporate social responsibility (Anazonwu, Egbunike, and Gunardi, 2018; Habbash, 2016; Khan, 2010), as bigger companies tend to be more salient, therefore, tend to attract more attention from the stakeholders, whomay compel them to appear good (Hyun, Yang, Jung, and Hong, 2016).Small firms as asserted by Obigbemi, Iyoha and Ojeka (2015) in most cases do not publish their end year reports and when they do so, is as a result of the statutory requirements. On the other hand, large firms due to their expansive shareholders base as well as their diverse background, they are compelled to disclose all the requisite information in order to not only retain but also enhance its reputation, investment and attract other prospective investors to the firm.

Previous studies have indicated that big firms even though they are endowed with more resources as well as earning higher profits (Swastika, 2013), normally adopt discretionary reporting frequently as compared to the smaller firms (Barako, 2006; Khodadaki, Khazami, and Aflatooni, 2010). In concurrence to this isSwastika (2013) who noted that large firms are more likely to avoid environmental disclosures through voluntary reporting. This propels the need to examine the effect firm size has on the association between corporate governance and environmental sustainability disclosures.

Smaller registrants (firms with less than $75 million public float) are associated with a deficiency of qualified personnel for dealing with the reporting requirements (Ettredge, 2011). The study further attached firm size based disclosure on the upcoming regulatory changes suggesting that firm size is an

important determinant of the ability to comply with accounting as well as disclosure requirements. In the USA, social and environmental committee (SEC) through an advisory committee established to look at the reporting practices of smaller public firms recommended that due to lack of capacity….with regard to internal compliance personnel as well as external professional advisors to the smaller public companies, they need not to be subjected to acceleration of Form 10-Q as well as 10-K filing (SEC Advisory Committee on Smaller Public Companies 2006).

Large firms listed at the securities exchange usually have greater impetus for income smoothing (one of the environmental management forms) in comparison with smaller firms, due to their greater political cost (Moses, 1997). The political costs appears to be great as a result of firm profitability which leads to attraction of various stakeholders (such as consumers, media, government and the general public) (Saftiana, Mukhtaruddin, Putri and Ferina, 2017; Pambudi and Sumantri, 2014; Widigdo, 2013) so that the firm's several policies have huge impact on the public interest in comparison to the small firms. Various studies have identified measures of firm size as the log of total assets (Badriyah, Sari and Basri, 2015; Pambudi and Sumantri, 2014; Subramaniam, McMacnus and Zhang, 2009) and logarithm of market value of equity (Ettredge, 2011). Out of the three firm attributes used to mitigate spurious results, the firm size was preferred as it significantly influenced the quantity of overall ecological disclosure of the sampled companies (Odoemelam and Okafor, 2018). This supports the study's application of the firm size as the moderating variable.

2.2.3 Control Variable

A control variable is one that isincorporated in multivariateanalyses towards identifying spurious relationships (Viswanathan, 2005). Sobel (1995) argued that unlike in pure and applied sciences research where the informed and methodological application ofcontrol variables is critical towards advancement of scientific knowledge,social research examines causal claims through demonstrating "temporally ordered covariation of variables"as well asthrough "discrediting alternative explanations as implausible".

The board size, that is, the number of directors sitting at the board meeting may impact on the degree and extent of environmental sustainability reporting practices as well as decision-making mechanism (Mahmood and Orazalin, 2017; Lone, Ali and Khan, 2016). It was lamented by Post, Rahman and Rubow (2011) that the larger and diverse boards improve disclosure practices since members bring varying perspectives, values and ideas towards the entity decision-making mechanism.

However, some studies have discussed that smaller boards can be better towards monitoring managerial activities as well as improving on effectiveness and efficiency of decision making. Decisions relating towards the content and level of ESD requires elaborate communication, unanimity, and consensus decision making among board members, and thus a lean board could be more effective in addressing such sensitive issues (Cheng, 2008; Rao, Tilt and Lester, 2012). The study applied board size as the control variable.

2.2.4 Environmental Sustainability Disclosure

Simpson (2013) asserted the word disclosure to entail "sharing, releasing, and communicating some useful" and relevant information. Traditionally, disclosure in accounting had been linked to conventional financial reporting, which in recent years has been broadened to incorporate among others value disclosure, sustainability disclosure (Mahadeo, Oogarah-Hanuman, and Soobaroyen, 2011; Farneti and Guthrie, 2009; Williams, 2008). Natural sustainability disclosure has two key implications: (i) creating reports yet likewise (ii) disclosure of data (Niemann and Hoppe, 2017). ESD is a branch of sustainability disclosure that deals with the ecologically actuated budgetary effects on foundations (Schaltegger and Burritt, 2000; Dim and Bebbington, 2002; Godschalk, 2008, Haque, 2011).

The study applied the GRI (2011) in developing the environmental disclosure checklist consisting of various items as used in other studies (Odoemelam and Ofoegbu, 2018; Odoemelam, Ofoegbu and Okafor, 2018; Odoemelam and Okafor, 2018; Aburaya, 2012). These items are categorized under; ecological Policies, ecological Sustainability, ecological laws and standards adherence, ecological associated products and procedures concerns, and other information associated to ecology.

Content analysis was applied to environmental sustainability disclosure items. Content analysis "involves codifying non-monetary as well as monetary data to a prior determined class so as to come up with series towards showing as well as data disclosing" (Guthrie and Abeyeskera 2006; Guthrie,Petty, Yongvanich and Ricceri, 2004).For the ecological quantity disclosure, items was assigned a value

which oscillates between zero and one according to the following criterion: the value of zero (0) assigned if the analysed company does not disclose environmental information on the said items in its reports a well as the value of one (1) assigned if the firm discloses environmental information on the item in question. For the ecological quality disclosure, appendix VIII indicates on how weights for the 31 ecological information was assigned as follows; financial quantitative (3) contrary to non-financial quantitative (2) or declarative (1); good (2) or bad (2) viz a viz neutral (1); forward-looking (2) in comparison to historical (1); and verifiable (2) viz a viz non-verifiable (1) information.

Sustainability disclosure detailing improvements have taken distinctive structures, one of them being triple bottom line (TBL) disclosure concept (fig. 2.1), where the three measurements are social, monetary and natural, or individuals, planet and benefit (Elkington, 1997). For corporate governance effectiveness, the concept has been cited as the most appropriate due to its holistic nature of value creation over the short, medium and long term (McFie, 2018). The concept has been attributed from the accounting profession and accounting bodies growing support, which results in likely changes within organization and management as well as the take with which 'institutions might communicate with the community and stakeholders in the provision of its services and operations'(Barrett, 2004). In the meantime, worldwide institutions supporting sustainability disclosures were established. One of them is the Global Reporting Initiative (GRI) that has built up a willful sustainability disclosure system.

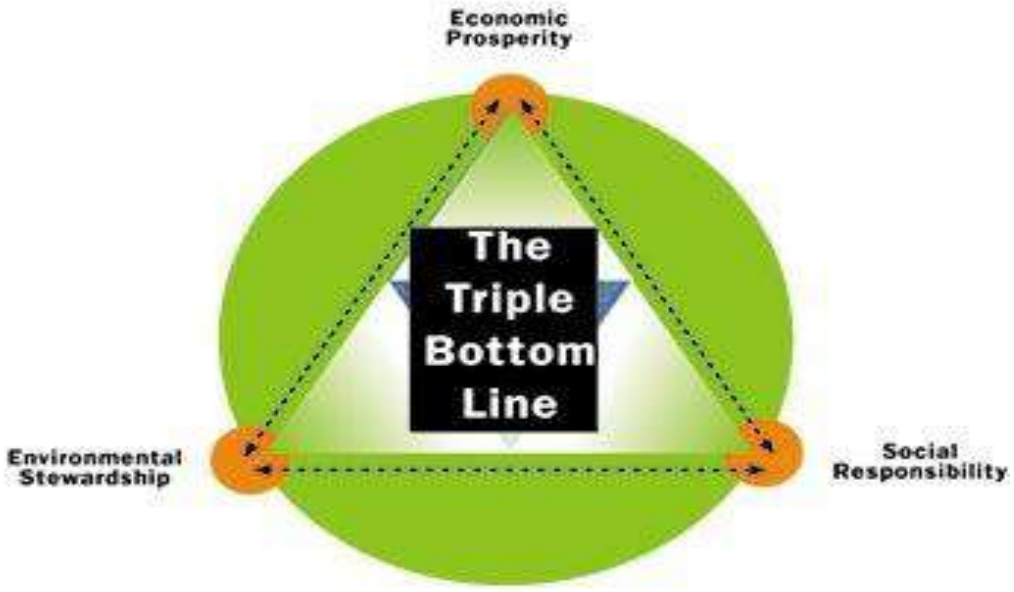

Figure 2.1: The Triple Bottom Line(TPL)

Source: adopted from Elkington(1997)

2.2.5 Sustainability Reporting Framework (SRF)

Lack of standardization in measuring and reporting sustainability issues as articulated by UNEP (2017) led towards mushrooming of various disclosure practices on bridging the space, leading to more misunderstanding on the item(s) to be both weighed and disclosed. Environmental sustainability disclosure has been emphasized over the various global reporting frameworks. For example, out of the nine global reporting frameworks, eight have the environment as the core subjects, and they include: 1) Global Reporting Initiative (GRI) Sustainability Reporting Guidelines, 2) Accountability: The AA1000 Series of Standards, 3) Carbon Disclosure Project (CDP) tool and framework, 4) International Integrated Reporting Council (IIRC) International Framework, 5) International Organization for Standardization ISO 26000, 6) Sustainability Accounting Standards Board (SASB), 7) United Nations Global Compact Ten Principles, and 8) WBSCD,

World Resources Institute (WRI) and the Greenhouse Gas (GHG) Protocol (Earnest and Young, and Center College of Boston on Citizenly Corporate, 2013).

It was highlighted by PriceWaterhouseCoopers (2016) that Sustainability Reporting Framework being one of the five primary components on sustainability reporting guidelines, where an organization is expected to select a disclosure system (or structures) to manage disclosure and reporting, clarify purposes behind selecting the framework(s) and give a general portrayal of the degree on the backer's application towards the framework(s) – utilizing a globally perceived or industry-pertinent system improves acknowledgment and equivalence. The two most common Global Reporting Frameworks on sustainability reporting, the Global Reporting Initiative (GRI) and the International Integrated Reporting Council (IIRC)(INTOSAI, 2013). For the current study, Global Reporting Initiative (GRI) and traditional reporting framework were applied.

The GRI is one of the primary engineers of sustainability disclosure, who's though its reporting frameworks were developed intended to be applied purposely on the private sector organizations. One of the guiding items is the report content which consists of standards about materiality, interested party comprehensiveness, sustainability setting and fulfillment. According to Guthrie and Farneti (2008), Ball and Grubnic (2007), Ball (2004) the framework presents a good trial towards overviewing development internationally notwithstanding being the basis for globally standardized, comparable, disclosures on entities sustainability.

GRI offers a practical attraction on entities after accounting innovation approval, rendering a chronology of an organization's impact due to its day-today activities, demonstrating some connection between its technique and its responsibility regarding an ecological worldwide economy (Greiling, Traxler, and Stötzer, 2015; GRI, 2014b). Further, the framework is claimed to be sector-neutral, covering sector-specific sustainability issues, and thus applicable to any size.

It was found out by Navarro, Berjillos, Lozano and Valencia, (2015) that currently, the most widely used guide on the reporting of sustainability data is issued by the GRI, and its relevance in the field of local government is highlighted in the recently published sustainability reports on Dublin and Warsaw. reported that GRI policies provide: a center substance for revealing that is applicable to all entities; and marker conventions that prompt on definition, degree, and accumulation techniques to help entities to guarantee significant and similar providing details regarding pointers(Leszczynska, 2012).

ESD is considered a leading guide towards area of sustainability disclosure, as reflected in the content of rules published by the governments of the Nordic countries. In agreement with the GRI contribution is Crognale (2009) that the design has had the best effect to date, and it is viewed universally as a standard data manual for the sustainability of both private and public sector entities. The GRI rules have a significantly more generous arrangement of prerequisites on ecological disclosure despite the fact that it is still far from finish (Gray and Milne, 2002). Company reporting by Mertens and Maas (2012) found that in Netherlands, the GRI standards are mostly used by large corporate companies

listed at the securities exchange at 71%, with an average of 82% survey indicating that GRI principles offer enough assistance towards sustainability disclosures.

These guidelines as reported by GRI (n.d.) are intended to fit with other conspicuous sustainability measures, including the OECD Rules for Multinational entities, ISO 26000 and the UN Worldwide Compact. Further, for the purpose of assessing sustainability reports, Greiling, Traxler and Stötzer (2015) argued that the framework is the most established as well as widely applied among the Triple Bottom Line (TBL) standards that are relevant for progressing from financial reporting to holistic accountability. All listed companies trading their securities in developed countries have a mandatory reporting (Integrated Reporting) framework, for instance, in the United Kingdom (UK National Audit Office, 2012).

Since its inception in 1997, the GRI framework has been regarded to be the global standards for environmental sustainability disclosure studies due to its comprehensiveness, adoption prestige as well as visibility not only on academicians but also policymakers (Mahmood and Orazalin, 2017; Kuzey and Uyar, 2017; Lodhia and Hess, 2014). The framework overcomes the shortcomings associated with the previous studies on ESD that dwelt on different aspects of sustainability in an isolated way (Mass, Schaltegger and Crutzen, 2016), by incorporating information on economic, social and environmental aspects of firm performance towards assessing the sustainability initiatives of firms (Fonseca, McAllister and Fitzpatrick, 2014).

The present study used the integrated GRI G3 framework to examine the moderating effect of financial strength on the relationship between corporate governance and environmental sustainability disclosure, due to the presence of public sector supplement created specifically for public sector organizations reporting, with its application in some countries. The latest version of the GRI G4 was not applied because of lack of pertinent information available such data on 'greenhouse gas emissions, anti-corruption measures' among others, considered vital for the public limited entities (Siew, 2015). The integrated GRI G3 framework incorporates various aspects of sustainability into three distinct classifications; economic, social and ecological initiatives,notwithstanding provision of anelaborate overview of sustainability practices (Mass *et al.*,2016; Villiers, Low and Samkin, 2014).

2.2.5.1 Relationship between Board Characteristics and Environmental Sustainability Disclosure

Aliyu (2018) investigated the association between corporate governance measures, namely, board size, board independence, board meeting (BM), risk management committee composition and corporate environmental reporting (CER) in Nigeria. Statistical analysis involved data obtained from the annual reports of 24 non-financial public listed firms in the Nigeria Stock Exchange. The study period (2011–2015) was limited to three sectors, namely, industrial goods, natural resources and oil, and gas. The study model was theoretically based on agency theory with panel data analysis utilized in analyzing data. From the Hausman test, the random effect model was applied in examining the impact of

corporate governance on CER. The findings indicated a positive significant association between board independence and CER. Similarly, a positive significant relationship between BM and CER is revealed in the study. However, there is no significant relationship between other hypothesis variables and CER. Finally, the study provides suggestions for future research and several recommendations for regulators, government and accounting professional bodies.

An examination was done by Mahmood and Orazalin (2017) on the relationships between corporate board characteristics and environmental sustainability disclosures (ESD) on all oil, gas and mining companies in Kazakhstan listed at Kazakhstan Stock Exchange (KASE). All data relating to board characteristics and ESD were manually collected from end year reports, investment memorandums, sustainability reports, and corporate social responsibility (CSR) report, as financial data were extracted from the firm's financial statements. The sample size was thirty (30) firms that publish their end year reports annually on their firm websites as well as KASE webpage, with 114 observations for the period 2010 – 2013 after six capable extreme values were eliminated. The statistical data was analyzed using ordinary least squares (OLS). Hausman's specification test was carried out to examine the validity of random effects as well as fixed effects dimensions. In addition, to test for multi-collinearity problems, the variance inflation factor (VIF) was obtained for each independent variable

The results showed that board characteristics such as board size and gender diversity are the most important factors in determining the scope and quality of sustainability information. Board size was significantly and positively related with

the composite ESD index, an indication that effective board size results into better ESD. On gender diversity, a positive relationship was exhibited, a sign that firms with women dominated boards tend to report more transparent ecological performance information as well as higher levels of environmental sustainability information. However, the empirical results provide weak evidence of the relationship between board composition and sustainability disclosure. The study, however, has several limitations; focusing only on the internal CG mechanism, single sector focus of oil, gas and mining firms limited to only 114 observations, single country study, with the recommendations for a comparative study between countries with specific regulations for board gender diversity and board committees and countries without such regulations could investigate the relationship between the presence of women on corporate boards and sustainability reporting (Al-Shaer and Zaman, 2016).

A study carried out by Gul and Leung (2004) on 385 listed firms in Hong Kong in the period 1996, on the relationship between voluntary disclosures by corporates and composition together with the quality of the directors' board. The dependent measures, voluntary information disclosures incorporated ecologically related items including ecological measures and ISO or other awards. The control measures used included: leverage, liquidity, company size, profitability, audit committee, audit company, listing status, growth of the firm, equity, loss, merged firms, equity market liquidity and industry type. Statistical data analysis was done using regression test while a disclosure index comprising 44 discretionary disclosure items was established in measuring the disclosures.

The results indicated that board of directors' composition and quality had an impact on managers' way of disclosing the voluntary information. On the role duality, the study recommended separation of the CEO and chairman position as lower voluntary disclosure was related to the CEO duality. In addition, the findings reported a negative relationship between voluntary information disclosures and companies having a higher composition of experts outside directors, with an opinion that the expert knowledge of non-executive directors moderates the chief executive officer duality/corporate voluntary disclosure association. For the control variables, the results indicated positive relationship between company size, audit committee availability, growth of the company, profitability, internally generated mode of financing and listing status. However, the disclosure was negatively related to the number of securities the directors' controls, as well as liquidity.

Another study by Hossain and Reaz (2007) involving a single period on the listed 38 banking firms in India evaluated the relationship between their particular characteristics and discretionary corporate disclosure. The results established that the entity size, as well as the assets already in place, had significant relationship with the disclosure. However, business complexity, cross-border listing, firm age, and composition of the board in terms of the level of non-executive directors were not significantly related to the discretionary disclosure level. Despite the findings, the study suffers from several setbacks such as being a single period and focusing on a single industry. Also, it evaluated aggregate disclosure levels instead of disclosure on category basis.

In Australia, Lim *et al* (2007) examined the relationship between board composition and discretionary reporting of 181 firms by coming up with a checklist of 67 discretionary items categorized as monetary, non-monetary and strategic. For the ecological information disclosure, it was contained in the non-financial category. To prevent endogeneity problem, a two-phase multivariate analysis was employed, first by estimating the association between the fraction of independent directors viz a viz size of the board and other firm characteristics associated with discretionary disclosure. Secondly, the study examined the impact of board composition based on the first phase fitted values, on the level of voluntary disclosure.

The outcomes indicated that the structure of the board has no relationship with the monetary and non-monetary discretionary disclosure. Similarly, it was found that independent boards of directors disclosed more discretionary "forward-looking quantitative and strategic" information. Generally, the results indicated a positive relationship between board composition and aggregate discretionary disclosure. Other identified determinants of discretionary information disclosure in the firm's annual reports included: magnitude of the company, sector affiliation, shareholders concentration, management compensation as well as investment growth set.

A study on 201 Malaysian firms listed at the Bursa Malaysia's Main and Second Boards for the annual period 2005 by Al Arussi, Selamat and Hanefah (2009) examined the association existing between discretionary financial level and ecological disclosures towards internet as well as technological extent, presence

of dominant personalities, debt level, CEO ethnic affiliation, and the company size. Statistical data analysis was carried out using multivariate tests and linear regression analysis. Stratified random sampling that was not proportionate was applied in sample selection. The results showed the internet financial and ecological disclosures being influenced by the CEO ethnic affiliation, technological level, as well as the company size. For the dominant personality predictor variable, it had a negative effect on the extent of financial disclosures even though not environmental disclosures. However, no significant association was depicted between debt level amount and profitability with financial or ecological disclosures.

In Portugal Monteiro and Aibar-Guzman (2010), an investigation on effects of large Portuguese firms' features on level of ecological reporting in their end year reports for the three years period (2002, 2003 and 2004) was done. The predictor variables were company magnitude, sector control by members, earnings, securities listing, external control and environmental certification. Statistical data analysis involved regression analysis and content analysis on a sample of 109 companies selected from 500 largest firms based on their sales. The results indicated an optimistic significant association between an entity magnitude and, securities listing and ecological reporting. However, a lack of measurable critical relationship between the degree of ecological data by testcompanieshaving aninternationalcontrollingfirm and the domestically controlledentities incorporated in the test was disclosed. In a similar vein, there wasn'tremarkable

association discovered between ecologicaldisclosureswith the true picture that a firm has acquired ecological approval.

A sample of 6,850 companies by Grüning and Bergerernst (2010) from 2003 to 2007 in USA investigated the relationship between corporate governance, measured by various metrics of 48 variables summarized in 8 items (ownership concentration, state of incorporation, executive and director compensation, board, audit, charter/bylaws, progressive practices, educational level of the directors) and disclosure practices examined through an innovative intelligence method (value chain, ecology, governance, consumers, monetary, workers, research and development, securities market, strategies, and society). The control variables applied included: firm size, loss, rate of growth, age, debt level, intangible assets, capital intensity, equity ratio, securities return and securities return volatility, market-to-book ratio, stock turnover, auditor type, company issuing, Tobin's Q, preceding year disclosure as well as corporate governanceownership concentration.

The results showed a properly governed company tends to lean towards detailed disclosure policy as well as more disclosure form. A positive impact of corporate governance on disclosure was observed in audit, ownership and progressive practices, and incorporation state. On the other hand, the negative impact was observed on director and executive compensation. In form of Tobin's q companies' valuation method, a positive association between corporate governance and disclosure was noted. In summary, particular association was

observed between corporate governance and disclosure on different scale and side.

A study by Post *et al.*(2011) on green governance issues examined the relationship existing between corporate governance characteristics (the composition of the director's board) and ecological corporate social responsibility (ECSR). The sample size included 78 Fortune 1000 firms including 2007, 1000 Fortune list of chemical companies as well as 2006, 1000 Fortune list of electronics firms. The association was evaluated through integration of data pertaining board composition, entity corporate social responsibility, as well as individual variances in attitudes concerning as well as ecological information matters. The disclosure metrics involved 26 items categorized into 3 aspects: governance information, information credibility as well as ecological performance indicators.

Data from Kinder, Lydenberg, Domini, Inc. (KLD) was used to measure an entity's ecological actions on various strong aspects (prevention of degradation through pollution, clean energy, systems of management, value-adding products and services among others) and various aspects of concern (hazardous waste, chemicals that deplete the ozone layer, emissions with significant environmental impacts, farming-related chemicals, changes in climatic conditions, wastes that are harmful, issues concerning regulations among several other concerns). Analysis of the KLD was measured using: KLD strengths, concerns, as well as the aggregate (the variance between strengths and concerns).

The predictor variable (corporate governance characteristics) evaluated in the form of directors' insider/outsider status, sex, age, and educational level. The industry sector, slack resources, and CEO duality were applied as control measures. The results indicated that a high number of outsider status board of directors is related with more favourable ESR disclosures as well as higher KLD strength scores. Further, the results indicated that entity's with three or more female directors awarded more KLD scores. To add to that, it was observed that the board of directors age was averaging 56 years together with higher directors proportion possessing Western Europe educational level had a higher chance of implementing ecological governance mechanisms.

In Nigeria, Adeniyi and Fadipe (2018) examined the impact of board diversity on sustainability reporting. The board diversity was measured using board size, board gender diversity and board independence on sustainability reporting among brewery manufacturing firms on Nigeria Stock Exchange. The study employed ex – post facto research design. Secondary data was used for the study. The sources of data included annual reports as well as accounts of firms selected for the study. Regression analysis was used for the panel data analysis towards establishing the association between sustainability reporting and board diversity.

The study findings indicated that board gender diversity does not significantly affect environmental sustainability reporting, contrary to Mahmood and Orazalin (2017). Surprisingly, the number of women on board of directors was as low as one (1) with that of man counterpart was ten (10) especially in Champion Brewery Nigeria Plc. Despite that, the highest number of females on board of

directors among the sample companies was three (3). The study recommends that number of women on the board of directors in brewery manufacturing industry should be increased. It was however limited to brewery manufacturing firms listed at the Nigerian Stock Exchange, thus suggesting similar study be carried out but with different sectors.

Another study by Ananzonwu, Egbunike and Gunardi (2018) evaluated the influence of firm board diversity on sustainability disclosure on a sample of listed manufacturing companies in Nigeria. The predicted variable sustainability reporting was measured using an Economic, Social, and Governance (ESG) index, while the predictor variables were board member nationality, the proportion of women directors, proportion of non-executive directors, and multiple directorships. Apanel research design within the longitudinal research design domain was adopted. The study population comprised listed manufacturing firms on the Nigerian Stock Exchange which was restricted to entities categorized under conglomerates, consumer goods, and industrial goods sector. Secondary data was used, extracted from the end year reports of manufacturing firms under study. Hypotheses testing were done using fixed effects panel regression analysis.

The findings indicated no significant positive influence of board member nationality, buta fraction of women directors, fraction of non-executive directors, together with multiple directorships were significant. The study recommended among others, the adoption of Nigeria Stock Exchange Sustainability Disclosure Guidelines for a unified integrated reporting framework for Nigerian firms, secondly, a heterogeneous board composition, which can leverage on the diverse

set of skills of board members.It is upon this backdrop that the study was tested using a hypothesis, in a null form, that:

H_{01}: There is no significant relationship between board characteristics and environmental sustainability disclosure

2.2.5.2 Relationship between Internal Controls and Environmental Sustainability Disclosure

A study by Leng and Ding (2011) asserted that most of the corporate governance scandals in organizations are attributed to the weak internal control systems such as director's remuneration, and level of education. The study that was largely driven by legitimacy concerns reported a close positive relationship between internal management systems and environmental management system (EMS) - and environmental disclosure on end-year reports (EDAR) with an adjusted R^2 of .462 ($p < .01$), This, therefore, questions the role of the applied accounting systems in addressing environmental reporting process with prior research negating inclusion of environmental issues on reported financial data. The study employed survey design method, primary data was collected using postal questionnaire, while subsidiary information was done using the selected 35 New South Wales local governments end year reports.

A Mann Whitney U test was carried out in evaluating possible changes between earlier and later responses in case of non-response bias. Data were analyzed using Spearman's Rank Correlation analysis. The results were in agreement with Burritt and Welch (1997). However, the study focused only on the quantitative aspects of

environmental disclosure, suggesting further studies be done on the content data analysis that would assist to establish if ecological disclosure was applied towards 'educating and informing' or rather 'changing/manipulating' the user perception of an entity ecological execution.

In Nigeria, Dibia and Onwuchekwa (2015) conducted cross-sectional study on oil and gas companies did not find remarkable association between firm efficiency (financial debt level)and environmental reporting at [(logit result, $\beta 2 = -.001$, $p = .894$) (probit result, $\beta 2 = -.009$, $p=.362$)]. The mean value stood at .62 with a standard deviation of .29. The Jarque-Bera statistics of 59349.46 and p-value of .00 were used to eliminate the sample selection bias. Secondary data was analysed using the binary (logit and probit) regression model based on Maximum Likelihood Huber/White Heteroskedasticity-consistent standard errors and covariance, in order to prevent Heteroskedasticity problem mostly related to cross-sectional data. Other researchers in tandem to this study results were Ahmed and Nicolls (1994), Mohammed and Tamoi (2006). For Healy and Palepu (1995), it observed that leverage may be the cause of ecological disclosure, and as an organization, it might require getting solution towards irregular data and principal-agent challenges with its interested parties.

In Poland, Hawrysz and Foltys (2015) examined the ecological dimensions disclosure of societal accountability of publicly owned entities, and whether they significantly differ from the ones in the European Union in terms of their ecological mitigation practices. A survey was a reason for information gathering where they were issued to delegates of intentionally chosen public sector entities

found principally in Europe. The examination was directed in 2012– 2013 on a gathering of 220 public entities (102 Polish and 118 other European). Factual information examination was finished utilizing the chi-square autonomy test together with quality measures (Cramer's V and C contingency coefficient), with a criticalness level of $\alpha = .05$. The outcomes demonstrated a critical error between the condition of the ecological obligation of entities situated in Poland and abroad. They additionally demonstrated that public-owned entities, those in Poland specifically, are making their initial phases in creating inside natural obligation. Be that as it may, public sector entities in Poland don't have inward control components of ecological duty.

A study by Ntim, Soobaroyen and Broad (2017) investigated the influence of internal governance structures towards voluntary disclosures extent and public accountability in United Kingdom higher education institutions (HEIs'). A public accountability and transparency index (PATI), modified version of Coy and Dixon's (2004) public accountability metric was employed, in measuring the degree of discretionary disclosures on 130 UK HEIs' annual reports. The predictor variables applied towards measuring governance structures were the audit committee quality, governing board diversity, governor independence, executive team characteristics and the presence of a governance committee, all which were associated with the level of disclosure. The study was guided by a multi-theoretical framework derived from public accountability, legitimacy, resource dependence and stakeholder perspectives.

In Kenya, Barako *et al.* (2006) evaluated the influence of private sector administration practices, control framework and organization features on environmental reporting by all listed companies (54) at the Nairobi Securities Exchange (NSE), for a nine years period (1992 to 2001). The governance characteristics examined were: board organization, board administration structure and review advisory group arrangement with a disclosure index applied in measuring the extent of non-mandatory environmental disclosures. Non-mandatory disclosure theory guided the study where data from the companies' end year reports were analysed using environmental disclosure index and regression analysis.

The findings indicated that the three predictor attributes influenced environmental disclosure. The presence of an audit committee, level of institution and foreign ownership, had a positive significant relationship with the extent of environmental reporting, while degree of non-executive directors had negative significant relationship with environmental disclosure level. On the board leadership structure, type of external audit firm, liquidity and profitability, there was no significant influence on non-mandatory ecological disclosures level. However, with the lapse of significant period notwithstanding the emerging corporate governance challenges in the recent past, no other study – as far as I am aware – has been done to confirm the result which may prove unstable with time passage.

An examination was done by Grüning and Ernstberger (2010) on the association between corporate administration and exposure in 6,580 sampled USA firms listed at New York Securities Exchange between 2003 and 2007. The independent

variable was estimated by a total index of 48 items categorized in eight ways: board, audit, carter/by-laws, country of formation, control structure, director as well as executive rewards, continuous best methods, and level of directors' academic achievement. On the other hand, disclosure was determined by a creative non-natural knowledge approach on ten informational approaches: employees, security market, environment, society, governance, strategy, research and development (RandD), financial, value chain, and customers. Moderating variables were: market-to-book ratio, size, equity ratio, age, ownership concentration, growth rate, capital intensity leverage, loss, intangible assets, inventory return, inventory return volatility, issuer firm, type of auditor, previous year corporate governance, inventory turnover, Tobin's Q, and previous year disclosure. Statistical data analysis was the multiple regressions.

The results indicated a strong positive significant relationship between private sector governance (for the review, country of formation, control concentration, continuous best practices) and the disclosures. However, for the executive and director compensation, there was an inverse association with the extent of reporting. On the moderating variables, a 3SLS modeling revealing a direct association between private entity governance and reporting towards increasing the value of the firm based on Tobin's q. Overall, the findings observed that well-governed firms provide more and of the highest degree disclosure. That notwithstanding, the disclosure varies across various corporate governance dimensions.

In the USA, Peters and Romi (2011) investigated factors influencing corporate governance greenhouse gas (GHG) emission disclosure through non-mandatory reporting by USA firms in the FT50. The sample was derived from firms participating in the Carbon Disclosure Project (CDP) for a period of five years (2002 to 2006). The major variables sued included; presence of ecological formation board and a sustainability manager, moderated for using the firm's characteristics such as environmental performance, inclusion of sustainability indices, cumulative number of previous disclosures, cross-listing, CEO duality, organizational control, earnings, magnitude, extension and gearing, oil industry, paper industry, metals industry, and chemical industry.

The results indicated a high positive association between "sustainability-concerned" private entity governance practices (environmental committees and corporate sustainability officers) and non-mandatory GHG emission accounting disclosures. Formation cohorts with requisite knowledge in sustainable ecological reporting were related to the reporting. Further, the more expertise emanating from overlap between ecological formations and review formations was observed to remarkably enhance the probability of GHG reporting.

Another study by Adams (2002) evaluated the within contextual determinants together with their effect on private sector social and moral disclosure. The determinants evaluated included attributes of the disclosure method (measured by corporate culture and governance procedures, stakeholders' nature and extent of involvement, as well as accountants' extent involvement) and attitudes to reporting (measured by observations about later growth in disclosure, disclosure

information, future disclosure, rules and examination, reporting expenses and incomes perception, and private entity norms), its effects, legislation and audit. Using the stakeholders' theory, a sample of seven companies, 3 United Kingdom and 4 Germany firms in the period 1998, all of them chosen in the chemical and/or pharmaceutical business from the biggest 400 firms listed in *The Times 1000* (1995).

The results findings revealed significant internal contextual variables that may have an effect on the extensiveness, quality, quantity, and completeness of corporate social and moral disclosure. The formal and informal aspect, level of involvement and the department involved had an impact on the level of reporting. The interviewees' attitudes were also found to have an impact on the nature and level of reporting. The study reported a variance between companies' attitudes towards audit, where several firms weren't having a review while others having the reviews but with small refinement. Furthermore, there was a general consensus that by corporates disclosure of "bad news" improved their credibility and image. The study however suffered from the selected sample having its focus on largest firms, rendering the results unreliable for generalization over the whole population. Further, it was cross-sectional as it was one year study and there failing to provide insight and trace the disclosure trend.

In Spain, a study by Echave and Bhati (2010) on cause of social and ecological reporting on a sampled 41 companies was based on the following three criteria: they actively traded their securities at the Spain Stock Exchange market either under IBEX-35 or IBEX Mercado; they had some CSR performance information

available; had immense export trade in Latin American economies.Data was analysed using a disclosure index on a 121 disclosure items checklist developed as per the Global Reporting Initiative (GRI) framework. The predictor variables used were the firm size, profitability, firm internalization and leverage. Statistical data analysis was done using the OLS method. The results did not find remarkable association between the gearing level and the private sector social reporting with a significance level of .931 and an adjusted R^2 of .083. The similarity was to other predictor variables (size, profitability, and export sales) and CSD. However, studies by Cornell and Shapiro (1987), Naser, Aburaya, Al-Hussaini, Duha-Al-Kwari and Nuseibeh (2006) found a positive relationship. The limitation of the study was based however on being a one year study as well as utilizing one source of secondary data (annual reports).

Another study by Ho and Taylor (2007) investigated the effect of sampled US and Japan 50 largest companies' characteristics measured by liquidity level, leverage level, profitability level, constituent industry members, and the company size, on the triple bottom line (TBL) reporting. Secondary data was the end year reports, stand-alone reports, as well as selected company portal reports, with data measurement based on the regression model. The findings indicated no significant relationship between the industries financial leverage and TBL disclosure, but a good significant relationship on entity magnitude and country with TBL reporting. Moreover, a negative remarkable association between entity magnitude, country, and TBL disclosure was observed. However, only Japanese companies were seen to disclose environmental issues as their key factor, which the study

attributed to different economy norms, legislative ecology as well as other organizational determinants on the two governments. However, the study suffered a setback of employing a smaller sample size, recommending for a larger sample size further research.

In New South Wales (NSW) Australia local governments, Qian and Burritt (2007) investigated environmental accounting practices on internal controls measured by waste management efficiency. The study employed the survey method where a sample of 140 local governments was selected out of the 152 NSW local governments. For statistical data analysis, a regression model was applied, with the findings revealed that by and large, the level of direct waste stream and action bookkeeping is much more than the level of cover-up and outer ecological cost bookkeeping, however county governments have a tendency to recognize and utilize more physical data related with squander streams and exercises than pertinent fiscal data. Also a positive relationship between waste management services and environmental accounting ($t = 7.133$, $p < .00$) with an adjusted R^2 for the model at .454 was reported.

For the external cost and impact accounting, the results indicated a weak positive relationship with environmental disclosures, by an average of 2.35. This was attributed to local governments tending to utilize a greater amount of physical data related to the waste streams and exercises than cost data, thus drawing 'less attention'. However, the study was limited to ecological disclosure methods for squandering services as well as operations and did not factor in some externalities associated with waste disposal and management.

Parsa and Kouhy (2008) study, focused on societal disclosure by entities trading on the Alternative Investment Market in the UK. Random sampling was carried out where out of 100 companies population, 90 companies were selected based on the availability of data, with their end year reports analyzed for three years (2001, 2002, and 2003). Statistical data were analyzed using Spearman Rank correlation two-tailed test, and Kruskal-Wallis test of correlation. The corporate characteristics independent variables used were the company size, corporate age, industrial background, and gearing. For the gearing, significant relationships were exhibited between social scores and gearing for the year 2002 and 2003, an indication that extensive financing of firm's activities through external sources results in more reporting of social activities leading to reputational enhancement with the investors (Smith, 2005). The results were in agreement with (Sengupta, 1998; Moussavi and Evans, 1986; Lang and Lundholm, 1993).

A study by Stanny and Ely (2008) examined climatic change factors associated with corporate environmental disclosures in the US through Carbon Disclosure Project (CDP). The 500 companies sample study was guided by the non-mandatory disclosure theory, with the predictor variables applied to be; corporate size, sector, external turnover, resource age, long-term assets commitments, leverage, Tobin's Q, earnings, previous disclosure, as well as entity control. The logit model on a two-tailed test was carried out with the results indicating no significant relationship between entity control, Tobin's Q, earnings, gearing, industry, and resource age with environmental disclosure.

In New Zealand, Mir, Chatterjee and Taplin (2015) examined the association between bureaucratic rivalry and ecological disclosures by the New Zealand regional governments. Longitudinal research was carried out in the end year reports for the financial periods 2005 to 2006, and all the way 2009 to 2010, where content data analysis applied in attaching scores on the level of ecological disclosure. Local government leverage level, urbanization, income per capita of community, media prominence, and bureaucratic prominence were the control variables used. The level of debt was applied as a control variable due to other studies having their findings that state-run organizations that are highly geared report more non-mandatory data as compared to lowly geared ones (Evans and Patton, 1987). The study finding was a remarkable association between extent of debt with sustainability reporting in all the years of study except in 2007-2008 and 2008-2009.

In Spain, Reverte (2009) studied Spanish listed companies' at the Madrid Stock Exchange using the measures of private sector social responsibility (CSR) reporting. The listed firms were expected to have been incorporated in the IBEX35 metrics with legitimacy theory preferred most in explaining the CSR disclosure. Further, the study was based on a multi-theoretical framework where the determining variables were sector responsiveness, earnings, control level, corporate size, press prominence, international listing, as well as gearing. A t-test and a Wilcoxon signed-rank test were done to experiment with the statistical remarks of the mean differences in the explanatory variables between both groups of firms. The test results showed that entities with an aggregate CSR rating more

than the median operate in a more environmentally sensitive industry (p = .008), have a higher media exposure (p = .000), a larger size (p = .010), and a less concentrated ownership (p = .004), compared to those firms with a CSR rating less than the median. In addition, they have lower leverage and are more profitable, even though these differences are not significantly different (significance level = .05) on the two entity groups. Three ratings were focused on for the data collected as follows: aggregate CSR achievement, CSR content scoring, and CSR administration framework scoring, with the regression findings showing no significant relationship on profitability and leverage with the CSR disclosure, contrary to Naser *et al.,* (2006) findings. However, private entity magnitude, sector responsiveness, and press prominence were remarkably related to the CSR disclosure.

A study in Malaysian listed firms by Al Arussi *et al.,* (2009) examined the determinants of monetary and ecological reporting through the global network. The measuring predictor variables used were: race of the managing director, extent of technological advancement, leverage, availability of superior characters, earnings, and firm magnitude. Secondary information was collected from the 201 quoted companies on the Bursa Malaysia's Main and Second Boards for the financial year 2005. A regression model was used in statistical data analysis. The findings did not indicate any significant relationship between leverage, and profitability with either internet monetary or ecological reporting. For the technological advancement, tribal affiliation of the managing director and the

corporate magnitude showed a significant relationship with the global network monetary and ecological reporting.

For Bhattacharyya (2014) twofold study in Australia, it investigated on; first, level of social and ecological disclosure using the year 2002 GRI guidelines; and then analysed the association between the degree of social and ecological disclosure and firm characteristics. The explanatory variables used were; the magnitude of the disclosing entity (net asset), earnings (return on total asset), sector ownership, age of the disclosing organization (period of formation), and magnitude of the disclosing organization's review entity (larger 4 or otherwise). Data was collected from 47 small and large Australian firms' end year reports drawn from five industries (Chemical, Forestry and Paper, Industrial Engineering, Industrial Transport, and Mining) selected on the basis that their operations most likely to be unclean or ecologically destroying (Elkington, 1997). Regression model and F-test were used to test the hypothesis. Findings of ecological reporting awards were categorized under 4 classes: 1) Common; 2) Power, water, and items; 3) Destruction and refuse administration, and 4) Others.

The findings showed that the level of SER was fairly low with the level of aggregate reporting being remarkably high for big companies in the Industrial Transport industry. The level of aggregate reporting was not related to the companies' years of operations and the external reviewers' magnitude. Those firms with more return on aggregate resources reported remarkably more social information. F-test values were critical at .01 levels, an indication that the predictor variables factored in explained the SER when taken together as well as

when individually taken. Further, the overall evidence indicated that the companies under study were driven more by social than environmental disclosures as depicted by the adjusted R^2 = .427, R^2 = .272 on social disclosures and ecological reporting respectively.

The study was tested using a hypothesis, in a null form, that:

H_{02}: There is no significantrelationship between internal controls and environmental sustainability disclosure

2.2.4.3 Relationship between Ownership Structure and Environmental Sustainability Disclosure

In Malaysia, a study by Haniffa and Cooke (2002) in 1995 evaluated the association between voluntary disclosure (non-mandatory reporting as well as non-accounting reporting) level and content, and several corporate governances, culture and specific firm's characteristics. The survey research design was employed on 167 firms' published annual reports, the Kuala Lumpur Stock Exchange (KLSE) annual listed firms handbook for the financial year 1995/1996, "New Malaysian Who's Who", Companies registrar, directors articles publication as well as sent out letters to the firms' secretaries asking for information that is not in the public gallery. Random sampling method was applied for ensuring sample representation of all sector groups. Voluntary reporting was measured using the corporate social responsibility disclosure index. The specific firm's characteristics were used as control variables. Statistical data analysis involved

the use of multiple regression, where multicolinearity tests, homoscedasticity tests and normality tests were done.

The regression results produced an adjusted R^2 of .463 negative significant association between corporate governance indicators (independent non-whole time service director, chairman, and percentage of family board members) and voluntary reporting. For all the culture-related characteristics, no significant relationship was found. However, on the seventeen specified company's variables, only four (profitability, international ownership, assets available and number of securities (shares) controlled by the top ten shareholders) turned out to have positive significant association with the voluntary reporting. With regard to industrial affiliation, all sectors firms' were observed to report less as compared to the construction industry, with the consumer industry having the lowest disclosure level. This study however only factored in three categories of voluntary disclosure variables in developed economies and suggested further study to be carried out in developing countries. Also, being a cross-sectional study, it is necessary to carry out a longitudinal study to observe the disclosure trends. In addition, it focused only on volume of disclosure, thus failing to indicate the subtle items inherent in strategic management plan.

An evaluation was done by Chau and Gray (2002) on the relationship between ownership structure and non-mandatory reporting such as ecological reporting, on Asians listed firms from Singapore and Hong Kong. The randomly selected sample size included 62 firms in Singapore and 60 firms in Hong Kong, collected from their 1997 end year reports, with the sample area being industrial firms only

namely: shipping and transportation, building materials and construction, publishing and printing, food and beverages, electronics and technology. Data was collected through a developed voluntary disclosure checklist with a voluntary disclosure index computed. Ownership structure was computed through the addition of equity share meant for the directors as well as one for the dominating shareholders towards arriving at the share of the entity's equity belonging to the outsiders. Statistical data analysis was carried out using multiple linear regressions. The control variables applied in analysis included the company magnitude, debt level, auditors' size, profitability, and multinationality.

The findings indicated that the level of ownership outside the entity was positively related to voluntary reporting – incorporating ecological reporting. In particular, the findings also showed that the extent of information reporting was likely to be less in insider or family-owned firms, a significant characteristic of the Hong Kong as well as Singapore securities (stock) market. However, the study was limited to a single period and thus a longitudinal study is necessary. Further, the study did not incorporate all sectors in its study but was limited to only five sectors.

A study carried out by Juhmani (2013) examined the association between ownership structure measures and the extent of non-mandatory information reporting – including environmental disclosures - of all 50 firms listed on the Bahrain Stock Exchange (BHS) in the year 201. The three ownership structure measures were namely: blockholder ownership, managerial ownership and state ownership. A disclosure index consisting of 34 items was used on the 41 listed

firms' 2010 end year reports. Statistical data analysis on firm's 2010 annual reports was carried out using ordinary least-squares regression, multiple regression models and bivariate correlation, with the aid of SPSS software. The three control measures applied included: firm size (total assets), debt level (firm's total liabilities to owner's equity) and profitability (return on equity, net income to owner's equity).

The results indicated a significant negative relationship at .004 significant level only between blockholder ownership and voluntary information reporting, supporting the hypothesis that Bahraini firms with large blockholder ownership level disclose little non-mandatory environmental information as compared to the ones with low blockholder. Other studies had similar results (Samaha and Dahawy, 2011; Marston and Polei, 2004; Barako, *et al*, 2006; Samaha, Dahawy, Hussainey and Stapleton, 2012;Zourarakis, 2009). However, managerial ownership and state ownership had no relationship with non-mandatory reporting. Consistent with the findings were Zourarakis(2009), Huafang and Jianguo(2007). For the control variables, firm sizeand debt level were related to environmental non-mandatory information reporting at .023 and .005 significance level respectively, an indication that large companies disclose more voluntary information compared to the smaller ones, and similar firms with high debt level disclose more non-mandatory information compared to the ones with lower debt level (Zourarakis, 2009; Barako *et al.,* 2006). However profitability does not have significant relationship with the extent of non-mandatory environmental

information disclosure. The study is however limited to a single period analysis and thus cannot indicate the disclosure trends over given number of years.

In Qatar, Naser, Al-Hssaini, Al-Kwari, and Nuseibeh (2006) evaluated the determinants of corporate social disclosures (CSD) on their annual reports for the financial period 1999/200. CSD was measured using the entity's size (represented by the market capitalization) and business risk (represented by the debt level as well as the firm growth), and ownership variables (represented by blockholder ownership, state ownership and managerial ownership). The sample size entailed 21 Qatari firms listed on the Doha Stock Exchange (DSE). Statistical data analysis involved use of Pearson correlation and ordinary least-squares, as well as content analysis for voluntary disclosure items where a CSD checklist was developed comprising 15 content phases within four measurable horizons: area, amount, evidence and theme. Results showed differences on CSD relating to the firm size as well as a business risk. However, on the ownership structure measures, the number of institutional investors, individual investors and government ownership, the results showed their little effect on the extent of CSD. The research though was limited to a single year. In addition, it focused on the factors affecting the CSD but did not look at the degree of association between the established factors on the CSD.

Another study by Ghazali (2007) in Malaysia for the financial year 2001 evaluated the effect of ownership structure on the firm's corporate social responsibility (CSR) reporting end year reports. Secondary data was applied, collected with the help of a CSR reporting checklist for measuring the end year

reports CSR disclosure level. Statistical data analysis was done using multiple regression analysis. Predictor variables included: ownership concentration, blockholder ownership, government ownership, firm size, industrial sector and profitability. The study area was on firms incorporated at the Bursa Malaysia Composite Index, where a sample of 87 non-monetary firms was selected.

Findings indicated that on even larger and most active securities (stock), there existed significant differences with regard to corporate end year reports social activities reported. The multiple regression output indicated that, in uniformity with the expectations, firms, where directors held greater amount of equity shares (owner-run firms), reported little CSR information, thus having less significance on CSR reporting, while firms with major state ownership held shares as well as director ownership reported more CSR information in their end year reports thus having a significant influence on CSR disclosure. Similar to the blockholder ownership, industrial sector and profitability had no significant influence on CSR reporting. The study was however limited to only larger as well as actively transacted securities (stocks) and thus could not be generalized to smaller and less active securities. In addition, the study was a cross-sectional one, thus cannot be able to show the trend.

In China, Huafang and Jianguo (2007) examined the effect of ownership structure, CEO duality as well as the composition of the board towards non-mandatory reporting (incorporating ecological reporting). Ownership structure was measured by blockholder ownership, foreign listing ownership, management ownership, legal-person ownership and government ownership. The sample size

was based 559 firmslisted at the Shanghai Stock Exchange (SSE)in the year 2002, consisting of eleven (11) industrial sectors. The control indicators used were: company size, debt level, growth of the firm as well as the reputation of the auditor. Secondary data was collected using a developed checklist based on the Global Reporting Initiatives (GRI) framework, and for content analysis, data was analysed using a disclosure index. Statistical data was analysed using an Ordinary Least Square (OLS) regression model.

The results indicated a significant relationship between non-mandatory ecological reporting and blockholder ownership as well as foreign shares ownership. For the managerial ownership, legal-person and government ownership, no significant relationship was observed with regard to non-mandatory ecological reporting. For the other predictor variables (board composition and CEO duality), they were related to lower reporting. In addition, it was found that companies that were big in size had higher non-mandatory ecological reporting level, while firms have growth prospects were unwilling to disclose non-mandatory information. However, no considerable relationship was found between non-mandatory ecological reporting with each of auditor image as well as the debt level. The study however suffered from several limitations such as: first, was that it did not cover all sectors firms listed as it only comprised of 45.7 percent of all listed companies in China, thus the results cannot be generalized to all listed firms; second, contrary to the previous studies, the developed disclosure checklist did not incorporate all non-mandatory information as laid out in the GRI framework and thus the award could have been subjected to errors.

For Esa and Zahari (2016) study, it investigated the influence of ownership structures and board characteristics on corporate social responsibility (CSR) disclosures in Malaysia. The control variable used was board compensation on a sample size of 100 biggest firms that were categorized by the revenues. Content analysis on the firm's end-year report was employed towards measuring the CSR reporting as well as board compensation reporting, where a checklist instruments having 21 items was utilised, borrowed from Ghazali (2007) though with some adjustments in order to accommodate the emerging CSR issues. For the predictor variable board compensation, the disclosure checklist from Ramli (2001) was applied except one item of the group that was excluded. Statistical data analysis was done using the hierarchical multiple regression models.

Results indicated that ownership structure and board characteristics have no significant influence on CSR reporting with an adjusted R^2 of .241 ($F = 3.486$, $P = .000$). Family ownership, board professional qualification, board size as well as independent non-whole time service director had a significant influence on CSR reporting at 5, 10, and 1 percent significance level. The study was however limited to the biggest firms in Malaysia and thus the need to incorporate all firms or even smaller in size ones. In addition, it was a single period study, as well as recommending future research to focus on both quantity and quality composition of sustainability reporting.

A study by Cormier, Magnan and Velthoven (2005) gave an opinion on developing and applying a multi-tiered theoretical framework which perceives a company's intention to have ecological disclosure as indicating its response

towards various degrees of influence such as: financial stakeholders information requirements, community ecological issues of concern to them that results to public pressure as well as an entity constraints and processes that could be either firm or nation-specific. Measuring of ecological reporting involved coding of thirty-nine items, categorized into six aspects such as ecological expenditures and risks, laws and regulations, pollution prevention, sustainable development, land remediation and contamination (as well as spills), and ecological management. The quality disclosure rating was evaluated on a score of one to three: 1 – general items reporting, 2 – specific items reporting, 3 – explicit reporting in either monetary or quantitative terms.

The following factors' effects on disclosure were evaluated: information expenditures (concentrated ownership and international ownership, transacting volume, risk, and dependence on the capital markets), financial position, media influence. Control indicators used were the size of the firm, the age of the fixed assets, and the SEC registrant. Ecological reporting quality was analyzed for the period 1992 – 1998 on a sample of 55 large German companies constituting DAX 30/DAX 70 indices. Findings showed that information value, represented by risk and ownership was capable significant ecological reporting factors. Media pressure was associated with ecological reporting, but there was no association between financial situation and ecological reporting. Further, the findings as well indicated that ecological reporting quality was dictated by the industry membership. Also, the control indicators (non-current assets age, company size were determinants of ecological reporting. In agreement with the institutional

theory assumption, evidence was available showing imitation and routine being determinants of ecological reporting quality. Generally, the study findings had a strong opinion that ecological reporting was multidimensional, with complementary driven forces.

On a sample study of 477 big United Kingdom firms drawn from a diverse range of industrial segments, Brammer and Pavelin (2008) examined the pattern of discretionary ecological reporting. It examined how the decisions companies come across in regard to each facet of quality, determined by company as well as sector characteristics. The analysis involved distinguishing between five facets of corporate ecological reporting quality; reporting of ecological policy, the description of ecological expectations, as well as availability of an ecological examination of records. Data regarding ecological reporting were acquired from the 2000 PIRC ecological reporting survey. Statistical data analysis was done using logit regressions and logit estimation method. Disclosure quality was assumed to be determined by the nature of a firm's business activities, its ecological performance, firm size, media presence, and financial resources, as well as composition of both entitlement and the Main Board.

The results indicated the firm's size as well as the nature of business activities as determinants of ecological reporting quality. More quality reporting of ecological concerns was observed on big firms that are associated with sectors' activities having ecological issues. However, media presence was found to have very little effect on enhancing discretionary ecological reporting. However, the sample size though drawn from diverse sectors was limited to the largest companies and thus

cannot be replicated on medium as well as small firms. It also lacked to distinguish in an explicit manner between the non-monetary features of the information reported. In addition, the study was based on a developed economy thus recommending a similar study to be done in an emerging economy.

In Spain, Prado-Lorenzo *et al.* (2009) examined the effect of shareholder power and widened ownership structure towards reason to report on corporate social responsibility (CSR) information. The sample size, with the period of study not indicated, was 99 non-financial Spanish firms trading their securities at the Spanish continuous market. Statistical data analysis was carried out using ordinary least regression and VARIMAX rotation. Guided by stakeholder's theory, it evaluated the level of contents, their quality as well as being objective by ensuring adherence towards rules pertaining to preparing of the GRI model. In addition, the study considered if the achievement of the said rules had been approved by the GRI institution, notwithstanding if the reflected information had been examined by an autonomous professional company. The evaluated variables consisted: the availability of financial institution, in the corporate ownership mechanism, availability of a natural person representing a major shareholder as well as the number of autonomous directors. Control variables applied were state power (measured by size, transport and communication units, construction units, energy units as well as industrial units), financier's power (measured by debt-equity ratio), strategic advantage (evaluated through ISO 14001 certification and OHSAS 18001 certification), and economic performance (measured by Return on Assets).

The empirical findings indicated that only a limited relationship between the availability of a physical individual that stands for an influential shareholder and corporate social reporting. They confirmed the influence imposed by some stakeholders such as state and suppliers, as well as strategic posture of the company, having a significant impact towards CSR report publication, with economic performance having a null impact towards the process. On the ownership structure characterized by the availability of the major shareholders, their perspective indicated an encouragement towards adopting GRI framework to be applied as a CSR disclosure model to be applied by firms on information disclosure. However, stakeholders such as financial entities and investors which are in a position to transfer funds quickly into and outside the firm with minimal or no effect on the securities value, as well as scattered shareholders seemed only to be concerned in the entity's monetary performance rather than towards its sustainable measures.

Further, Rupley, Brown and Marshall (2011) study in 361 United States firms drawn from the Dow Jones Global index over the three-year duration (2000, 2003 and 2005), examined the association existing between specific aspects of multistakeholder governance and qualitative ecological reporting of discretionary information. The sample size was drawn from five industries namely: electrical utilities, food, and beverage, gas and oil, chemical, pharmaceutical and biotech. The indicators applied towards ecological reporting were compliance, mitigation of pollution, product accountability and environmental sustainability. Data was

gathered from the company's annual as well as stand-alone reports, with both univariate and regression analysis used in statistical data analysis.

It evaluated the role of ecological legitimacy (represented by ecological media cover), impact of institutional investor entitlement (consisting of both long-dimensions as well as short-dimension institutional entitlement) and the effect of multi-stakeholders governance (such as board autonomy, gender diversity, several directorships, separation of the CEO from the position of board chair as well as availability of CSR committee). Global Reporting Initiatives (GRI) framework was used in developing a disclosure index towards addressing the strategic implications of ecological behaviour. Control variables included: profitability, size of the entity, industrial sensitiveness, sensitivity of regulation as well as the availability of separate corporate ecological report.

Results showed that discretionary ecological reporting quality was positively related to board independence, gender diversity, and several directorships but had a negative association with environmental media. In addition, the level of multiple boards' directors was found to be positively associated towards the three levels of discretionary ecological reporting quality, while board independence, as well as diversity, was each positively associated to at least one form of discretionary ecological reporting quality.

An evaluation was carried out by Marshall *et al.* (2011) on the relationship between a specific dimension of corporate governance and quality of discretionary ecological information reported by the firms. A sample size of 183

firms from the Dow Jones Worldwide index for a period of three years (2000 to 2002) was extracted from five sectors (oil and gas, utilities, food and beverages, chemicals, pharmaceuticals and biotech). The two specific corporate governance associated determinants evaluated were the shareholder proposal outcomes (whether withdrawn, disqualified or voted) and institutional ownership variety (consisting both short-dimension and long-dimension ownership). For the ecological reporting, various non-monetary measures applied included: environmental sustainability, product stewardship, pollution mitigation, and compliance, with the index towards the same developed where the reported items were categorized into eight various degrees of reporting. The ecological data were acquired both from the companies' annual or 10-K reports and stand-alone reports. Company size and level of profit were used as control variables.

The findings indicated a lack of evidence with regard to an association between long-dimension institutional ownership as well as any of the discretionary ecological reporting quality measures. Despite this, short-dimension institutional ownership was negatively associated with the entire four levels of reporting. The study as well reported uniform positive association between withdrawn agreements and the discretionary ecological reporting with regards to product stewardship, pollution mitigation, and compliance. However, even as the resolution disqualification was found to be having a marginal significance as well as having a positive association with only product stewardship form of discretionary ecological reporting quality, the research study did not manage to

find an association between the number of resolutions which were voted on as well as any of the entire four categories of reporting.

The study was tested using a hypothesis, in a null form, that:

H_{03}: There is no significant relationship between ownership structure and environmental sustainability disclosure

2.2.4.4 Moderating Effect of Financial Strength on the Relationship Between Corporate Governance and Environmental Sustainability Disclosure

A study by Qingliang and Luo (2016) investigated how firm - and country-level determinants affect corporate ecological transparency on selected global multinational firms. It was based on a sample size of 243 Global 500 firms, where the effect of shareholders' interest in environmental information, supplier's concern, firm size, industry membership, the availability of emission trading scheme (ETS), strict ecological regulations on corporate environmental transparency. Various theories of non-mandatory environmental transparency were applied such as legitimacy theory, shareholder theory and stakeholder theory, and institutional theory. The study employed cross-sectional research design. Statistical data was analysed using ordinary least squares and logit regression. Results indicated significant relationship between firm size and environmental transparency. However, one of the limitations was the one year data period which the current study overcame by having a longitudinal study that helped to show the trend.

Ettredge (2011), examined the effects of firm size, corporate governance quality, and bad news on the USA firms' disclosure compliance. The disclosures studied were firms which provided Form 8-K Item 4 when changing their external auditors. The test sample size was 128 companies that failed to comply with 8-K Item 4 disclosure requirements reported in SEC staff comment letters14 posted on the EDGAR web site from May 2005 through April 2007. Firm size was measured using the natural logarithm of the market value of equity. The test sample concentrated on three industries: manufacturing; services; finance, real estate, and insurance. The control variables applied were external financing and financial health. Multiple regression model and paired t-tests were used to analyse the secondary data.

Findings indicated that size was not highly associated with the disclosure compliance at p= .192. However, large firms characterised with the value of equity more than $75 million were marginally significant at p=.093. The study nevertheless due to its inferences with regard to lack of explanatory power of size in the presence of variables having corporate governance quality could not be applied to other disclosure settings which do not exhibit similarfeatures. The non-disclosure compliance associated with firm size as well as corporate governance quality was regarded to occur due to small firms lacking qualified personnel and internal controls. It recommended future research to study on whether size represents ability to comply in other more complex mandatory disclosure contexts.

In Australia, Karim and Rutledge (2004) found a pessimistassociation between the magnitude of public as well as private organizations and the extent of environmental disclosures (*p=.719)* with an adjusted R^2 of .325. Multiple regression analysis was used with a one-tailed test performed for the size variable. A stakeholder and legitimacy theory guided the study.

In Indonesia, a study of 56 local authorities by Agustiningsih, Murni and Putri (2017) revealed a pessimist association between the local government magnitude and the degree of financial report accounting, with t-count at -.601 and a significance level of $p = .55$ and an adjusted R^2 of .153. Even though on some studies the adjusted $R^{2s}$are relatively small,on the reporting studies is a bit allowable (Ho and Taylor, 2007; Ali *et al.* 2004). The audit findings acted as a moderator. The secondary data was analysed using a moderated regression analysis, with agency theory guiding the study. However, the results were in contrast with Martani and Liestiani (2010) who found a positive significant effect of local government size (resident population) and financial report disclosure.

In Nigeria, a study by Dibia and Onwuchekwa (2015) of oil and gas companies applying the content examination method examined on the determinants of ecological disclosures. Secondary data was analysed using the binary (logit and probit) regression model based on Maximum Likelihood Huber/White Heteroskedasticity-consistent standard errors and covariance, in order to prevent Heteroskedasticity problem mostly related to cross-sectional data. The findings indicateda negative critical association between firmmagnitude and environmental disclosures [(logit model, β1=-.141, p= .00) (probit model, β1=-.088, p= .00)].

Outliers were measured using the Jacque-Bera statistics, results at 12.029 with a normal distribution at 5% significance level ($p<.05$). Stakeholders' theory guided the study. Consistent with the study findings were Prado-Lorenzo (2009), Reverte (2009), Garcia-Sanchez (2008), while Echave and Bhati (2010) who found no significant relationship. Prado-Lorenzo (2009) in particular observed that the government plays a very key role as an agent for influencing firm's environmental disclosures.

Another study by Gray *et al.*, (2001) evaluated the association between social and ecological reporting of the leading 100 United Kingdom firms and revenues, capital employed,size of employees, company size as well as the profit. Content analysis was used to analyze secondary data drawn from CSEAR (The Centre for Social and Environmental Accounting Research) Social and Environmental Disclosure Database for a period of eight years from 1988 to 1995. Both non-mandatory and mandatory disclosure theories were applied where a strong positive relationship was depicted between social and ecological reporting as well as the firmmagnitude. However, the value of differences exhibited by company magnitude and earning variables was not large even if it was statistically significant, with an average adjusted R^2 of .0288. On the various theories used, the study lacked sufficiently specified theories behind on corporate environmental responsibility disclosures. In addition, the study selection of the sample size was guided by firm's large size, making the results not generalizable to the entire population. This, therefore, led to the inconclusiveness of the existing research findings.

With similar shortcomings of a small sample, size utilization was Branco and Rodriques (2008) on Portuguese 49 listed companies sample study that investigated on determinants of social responsibility disclosure on end-year reports and websites. It was guided by two theories; resource-based theory and legitimacy perspective, reporting beings categorized into environmental, products and consumers, human resources, and community involvement. The predictor variables used were: level of global undertakings, entity magnitude, type of sector, closeness to the customer, ecological responsiveness, and press prominence. Earnings and gearing were applied as moderating marginals. Content analysis was applied with the findings revealing only company size and media prominence having a significant relationship with social responsibility disclosure, with the other variables not explaining.

In Qatar, Naser *et al.* (2006) evaluated a test of 21 firms inQatar on factors influencing private sector social disclosure (CSD) where companymagnitude was determined by its security valuenotwithstandingoperationsdangersthat could be evaluatedusing gearing, ownership concentration, and corporate improvement. The companies are listed at the Doha Stock Exchange, their end year reports analysed for the financial year 1999/2000 using content analysis. The study was guided by agency theory, bureaucratic economy theory, legitimacy theory, stakeholder theory together with the accountability approach. The results indicated a significant relationship between the corporate size (measured by the market capitalization), the business risk (measured by the leverage and the

corporate growth) and the CSD. However, ownership concentration did not have a significant relationship with the level of CSD.

For Cooper and Zainudin (2009) study, it examined the coverage, non-monetary and ways of disclosure from a sample of 315 listed firms on environmental issues. The cross-sectional study was carried out for 1 year (2005) on both developing and developed economies, guided by the legitimacy theory. The variables examined included the firm size, country's accounting system and economic development, overall membership, gearing and profitability. The qualitative issues addressed in end-year reports and stand-alone reports were used to analyse the qualitative information aspect. Further, it was measured through the nature and depth of quantitative disclosure, with some targets being treated as features of higher quality, a similar lane applied by Toms (2002). Environmental information indicators used for non-monetary assessment were apportioned the ordinal scale: 0 for non-reporting, 1 for only non-monetaryreporting, 2 for only non-monetary quantitative reporting, and 3 for monetary quantitative reporting.

Results found relative size to have a significant influence on disclosure although ecological responsiveness indicated by the segmentdid not appear material. That being the case, it was observed that big firms were more or lesspreparing stand-alone reports in case they are in a higherresponsive segment. Both the accounting systems and the economic development were revealed to possessa strong significant association with the degree of environmental information reporting in the stand-alone accounts. For the gearing and profitability, they had a negative

and weak optimisticassociation respectively with the form of environmental reporting.

In Australia, Qian and Burritt (2007) investigated environmental accounting practices in New South Wales (NSW) Australia local governments on waste management. Statistical data analysis was done using a non-parametric test; Kruskal-*Wallis* test, and a 2-tailed t-test. The results did not reveal significant relationship between environmental reports of urban councils ($\chi 2 = 5.446$, $df = 3$, $p > .1$) and rural councils ($\chi 2 = 6.992$, $df = 2$, $p > .1$). The comparison carried out was of the ecological reporting applications between the city and rural councils four categories of, little, medium, vast and huge for the urban boards, while for the rural ones were medium, large and very large. This was led by the varying sample figures and dissimilarchangeon the various sample categories. The results, therefore, meant that the local government size does not determine environmental accounting disclosure. The study employed survey method, where exploratory conversations were carried out with squander administrations supervisors and ecological directors. The chosen sample size of 140 out of 152 NSW local governments was due to the leading 'level of environmental protection expenditure' and 'kerbside recycling services' (Resource NSW, 2003).

For Navarro *et al.,* (2015), it studied on local government's motivations to improve the sustainability transparency established anoptimistic association between the populace magnitude and density, as well as the degree of ecological sustainability reporting at +.095 with an adjusted R^2 of .743. Multiple linear regression analysis and factor analysis as well as used, with the Kaiser-Meyer-

Olkin (KMO) test and Bartlett 's test of sphericity,carried out to determine the appropriateness of applying factor analysis. The study was guided by legitimacy theory and stakeholder's theory, with stakeholders' theory being more closely related with demographics (population size and density) and professional qualifications, while the other factors being closely related to legitimacy theory. With similar observations were Gallego-Álvarez, Rodríguez-Domínguez and García-Sánchez(2010), Debreceny, Gray and Rahman (2002),González, Cárcaba, Ventura and García, (2011) studies. Further, the study overemphasized on environmental variables consideration viz a viz general, economic and social variable, contrary to Guillamón, Bastida and Benito(2011).

In the 290 Swedish municipalities, Tagesson, Klugman, and Ekstrom (2013) study on the level of sustainability reporting in the end year reports found a strong positive criticalassociation between ecological disclosures with the municipal magnitude (measured using net operating cost) (p >.001) with an adjusted R^2 of .077. Its collinearity test established a collinearity problem between the net operating costs and inhabitants, thus using the net operating costs variable in the regression to measure size as it was less correlating with the tax rate. Multiple regression model was used with Durbin-Watson test results of 1.949. A multi-theoretical framework derived from the GRI guidelines was used, with empirical data source based on the end year reports.

In Germany, Cormier *et al.* (2005) examined the responsiveness of the firm to disclose environmental information based on various factors: economic partner's data demands, the community's ecological disturbances. For the environmental

disclosure, it was determined using a coding consisting of 39 things categorized into 6 aspects: pollution abatement, sustainable development, ecological expenses and dangers, laws and regulations, land rejuvenation and pollution (including spills), and ecological administration. Scoring on the qualitative aspects was based on the following: 1 for an item generally discussed, 2 for a specifically discussed item and 3 for a thing portrayed expressly in money related or quantitative measures. The ecological revelation quality was broke down for the period 1992-1998 on an example of 55 substantial German firms that included the DAX 30/DAX 70 lists. The indicator factors inspected were: data costs (estimated by chance, dependence on capital markets, exchanging volume, concentrated possession, and outside proprietorship), money related condition (estimated by advertise return and use), and press prominence. Mediating factors were the company magnitude, settled resources age, and SEC registrant.

The findings indicated that environmental disclosure was related to information cost and media prominence. However, no relationship was found between environmental disclosure and financial conditions. In similar vein, firm size, and fixed assets age significantly influenced the level of firm's environmental disclosure at some particular years

Långström, Lindbergh, and Wilson (2017) study on public municipal housing companies as to corporate social duty (CSR) reporting found a relationship between environmental disclosure and social citations. Content analysis was done on the end year reports of the sampled 50 firms out of industry population on 263 companies that were set usingClarkson, Li, Richardson and Vasvari,(2008) and

Sutantoputra (2009), environmental index and social index respectively. The reporting framework was set using GRI.

An examination by Ribeiro and Aibar-Guzman (2010) was on factors influencingecological reporting applications in Portuguese local public sector. Sampled survey of medium-sized, biggerurban councils, as well as municipal firms, were applied where primary data involved postal questionnaires. Statistical analysis tools involved the regression model and the environmental disclosure index. The predictor variables applied were the organizational size, forms of ecological administrationapplicationson advancement, and environmental accounting standards. Findings indicated that organizational size and the level of ecological administration applicationdevelopment were optimistically and significantly associated with environmental accounting disclosures. However, ecological disclosure principles weren'tin a positive way related toadvancement of ecological reporting norms. Further, the study noted a low degree of environmental accounting practices development, which could be attributed to the study focusing on small and medium-size organizations, fewercommunityforces as well as economicalecological rules (Greiling and Grüb, 2014).

A study by Greiling, Traxler and Stötzer (2015) investigated on sustainability disclosureby the Australian, Germany and Switzerland public segment in line with the application of GRI. Further, the study assessed the type of data disclosed in order to determine whether the well-balanced share of economic, environmental and social information are reported. The number of employees were used to measure the size of the organization. Data was collected through

documentary analysis of external reports for the year 2012-2014, with the study applying legitimacy theory and stakeholders' theory. The GRI database was used as a source for sustainability reports on a sample size of 42 (nine from Austria, nineteen from Germany, and 14 from Switzerland). A correlation analysis was carried out to evaluate whether or not larger public sector entities were applying the GRI and the extent. The results indicated no critical association between the magnitude of the public sector organization with total compliance rate with regard to economic, social and environmental disclosure (α level = .05, ($r(40) = .197$, $p = .211$). However, it was noted that PSO applying GRI guidelines complied to a relatively great extent even though they depicted significant variations as well as clear information reported imbalance on the three pillars of sustainable development.

A Durbin-Watson test in 290 Swedish local governments by Tagesson, Klugman, and Ekstrom (2013) of 1.949 was reported with an adjusted R^2 of .077. The results did not find a significant relationship between solidity (measured by equity/total assets) and environmental disclosures, where multiple regression analysis was employed. The suggested reason for lack of association was attributed to environmental disclosures being targeted to some few specific stakeholders who provide municipalities with finances, such as the central government and the voters. In support of the findings is Rockness, 1985, whose studies indicated lack of association between private entities ecological execution and environmental reporting.

Thus, the study hypothesizes, in null form, that:

H_{04}: There is no significant moderating effect on the relationship between financial strength and environmental sustainability disclosure

2.3 Theoretical Framework

Previous studies have utilized several theories in explaining the impact and relationship between CG and ESD (Mahmood and Orazalin, 2017; Hahn, Reimsbach and Schiemann, 2015). Among the theories applied are; legitimacy theory, stakeholder theory, and agency theory.

2.3.1 Legitimacy theory

The phrase legitimacy has been commonly defined by several researchers with Lindblom (1994) being conspicuous in bringing it out as "a condition or status which exists when an organization's value system is congruent with the value system of the larger social system of which the organization is a part". According to Bhattacharyya (2014), Deegan (2002), Patten and Crampton (2004), Chen and Robert (2010), it is among the domineering theories on the field of societal reporting studies. Literally, legitimacy can be understood to mean a sense of approval, which can be achieved by constructing harmony between social values and organizational behaviours (Lodhia, 2010). The theory "stresses that an organization must be accountable for its actions" (Greiling and Grüb, 2014).

In other words, it can be termed to be a condition or status in which the value systems of an organization are in congruence with the value systems of the larger society. Legitimacy is something granted by organizational stakeholders. Lodhia (2010) initiated the idea of legitimacy within the sustainability and environmental

disclosures debate that: "*Institutions enquire in establishing harmony between the social norms related with or implied by their undertakings as well as the values of an approved character in the bigger social structure where they are apart. By these two value frameworks being harmonious, institutional legitimacy can be spoken of. If a real or significant difference is present on the two norm structures, a threat to organizational legitimacy was experienced*". Deegan (2002) observed that the theory seems to focus more on what an organization report, rather than what they do and thus becoming popularly used for non-mandatory disclosure of environmental information.

The theory has extensively been applied by the firms and their managers, mainly due to the public prominence as well as those companies with poor environmental track record trying to gain legitimacy through disclosing sustainability information in their financial reports (Cho and Patten, 2007; Deegan, 2002; Lodhia, 2005; Patten, 2002). This in the process influences as well as captures environmental agenda in the financial reports (Larrinaga-Gonzalez and Bebbington, 2001; Owen, Swift, Humphreyand Bowerman, 2000; O'Dwyer, 2003; Dey, 2004).Also, its wide use in the corporate sector is alleged to serve the interest of all firms' stakeholders. This is due to the fact that corporate sector entities have a "contracts legitimizing their existence and actions" (Cormier and Gordon, 2001).

Most of the entities especiallyonespreparing stand-alone accounts, their explicit objective is to gain public legitimacy. posits that legitimacy theory has been widely applied in explaining ecological and social disclosures since it relies on the

idea of “social contract” between the firm and the wider community (Campbell, Craven,andShrives 2003; Deegan, RankinandVoght, 2000). The creation of broad corporate boards having diverse stakeholder groups can enhance an entity’s reputation and ultimately increase its legitimacy in wider societal contexts (Mahmood and Orazalin, 2017).

Corporate social and ecological reporting, in a nutshell, is provided as a justification for an organization’s continued operations(Ghazali, 2007). The said observation has been widened to incorporate recently called ‘environmental legitimacy’, which has been termed to be “the generalized perception or assumption that an entity’s corporate ecological performance is desirable, proper or appropriate” (Bansal, 2005; Bansal and Clelland, 2004). This ecological legitimacy may determine on how an entity chooses to express its ecological support, thus management decision concerning ecological disclosure (Rupley *et al.*, 2011; Aerts and Cormier, 2009).

However, with the theory major focus on compliance with the societal aspirations as enshrined in the social contract, critics have it that the society comprises of different groups with varying capability to dictate on organization’s operations. Furthermore, the theory, which is mostly grounded on perceptions, it has not set an adequate measure of the impact of reporting dynamics in the opinion of target publics in isolation from other determinants and occurrences in the society (Aburaya, 2012; Campbell *et al.*, 2003).

Thus, the theory hasn't addressed the varying stakeholders' conflict of interests through quality and quantity ecological disclosures. Prior studies have established that the theory was insufficient towards explaining fully corporate social and ecological disclosures, showing that the association between the theory and disclosure was mutedly supported for ecological issues, not yet confirmed for energy and community issues as well as subject to conflicting evidence for human resource issues. Previous literature has portrayed wavering support for the legitimacy theory, thus concluding that it gives limited facts on the decision to report ecological information (Joseph, 2007). Its reference by various firms through discretionary disclosures is as a result of fear from violation of the social contract.

Even though legitimacy theory is perceived as a most probable reason for the recent upsurgeon ecological reporting,with corporate entities striving to be "greenish in their operations" (Prasad,Mishra and Kalro, 2017; Braam,Uit de Weerd, Hauckand Huijbregts, 2016; Lan,Wangand Zhang,2013), this perception will only be right when the rule of law is strictly observed, as well as investors and citizen's entitlements to healthy ecology are enshrined in the Constitution (Odoemelam and Okafor, 2018). Thus, the legitimacy theory has not been able to provide attention towards conflict of interests of the various stakeholders, with the assumption that ecological sustainability disclosure is likely to be sufficient quantitatively and qualitatively, that is questionable since it may not actually be the matter.

2.3.2 Stakeholder theory

The theory put emphasis on the existing relationship between the firms' action and the resulting effects on their stakeholders. Firms cannot survive without the necessary support of the stakeholders with their back up required towards aligning its ways of operations to gain approval (Gray and Milne, 2002). With the increased awareness on the need to protect the ever degrading environment, this has resulted to pressure by the stakeholders towards firm's being compliant more especially on their activities. A firm's goals and objectives can be realised by ensuring a balance towards the 'conflicting interests' of all interested stakeholders (Mahmood and Orazalin, 2017). Thus, companies must strive towards meeting all the interest of its diverse stakeholders, and this was possible through adequate disclosure of all relevant social and ecological information in order to gain back up and go hand in hand with the stakeholder's interests.

The theory is an extension of the agency perspective as the role of the administrative organ is enhanced from ensuring the safeness of only the shareholder's interest in protecting all stakeholders' interests. Thus the narrow perspective of agency through focus of shareholders only has been significantly changed, with the theory taking into account that is linked to several social, ecological and ethical considerations. It, therefore, support improvements on corporate reporting policies, implementation of CSR practices as well as the establishment of risk administration policies towards managing the conflicting interest of different stakeholders.

Corporate governance must incorporate an all-inclusive approach that appreciates as well as ensures the members' and stakeholders' rights are taken care of(Bokpin *et al.,* 2015). This is notwithstanding ensuring that the firm is fully committed to its wider responsibilities towards enhancement of sustainable development. Historically, the stakeholder theory was propagated in line with three major developments in the political, intellectual as well as economic realm during the period between 1970 and 1980. In this regard, the principal-agent contract was introduced in relation to the shareholders and managers. Its interpretation which is also referred to as 'stockholder theory' was backed up by the second vital development of the period, as well as the upcoming of the free-market non-public assets economic policies features of the 1970s and 1980s.

There have been various debates with regard to the legitimate role of the management concerning social responsibility engagement which is seen to sometimes go against the core purpose of firms operations which is to maximize profit/wealth of the shareholders through minimization of loss/expenses. To most of the firms, corporate social responsibility (ecological reporting being part of it) is perceived to be unnecessary costs that can be avoided because of its lacking direct relationship with the revenue generation.

The stakeholder theory in regard to the board size argues that larger boards including members from divergent stakeholder groups can influence on the inclusion of multi-dimensional determinants in the corporate's environmental sustainability disclosure practices as well as consequently broaden the scope and improve the quality of ESD practices (Rao *et al.,* 2012). The study further, on the

board independence and ESD, observes from the stakeholder theory view that the presence of independent as well as outside directors on firm's board is to have a significant improvement on CG mechanisms since these directors are able to advocate the long-term economic, social as well as ecological sustainability of entities.

However, with the increased emphasis of other stakeholders having different interest on the company's activities, and are critical towards 'success or failure' of the organization (Aburaya, 2012), with each of them having varying expectations with regard to their return on engagement (Crowther and Jatana, 2005). Freeman *et al.* (2004) argue that the theory "requires the managers to bring out clearly the shared sense of the value" they inculcate as well as what brings about its core stakeholders together. In addition, it expects managers to come out clearly with regard to how they want to carry out business, with particular emphasis on what kinds of association they require as well as need to create with their stakeholders to deliver on their purpose.

In defining what stakeholders' theory is all about, various trials have been made. Prime stakeholders are those whom without their active engagement, there's no continued operation of the firm as a going concern as they hold a direct economic share in the company. They include the shareholders, managers, customers, vendors, financial institutions, employees, regulatory authorities (government) and the community. Shareholders would like to have information on the financial performance, financial position and changes in financial position (Ofoegbu,Odoemelam and Okafor, 2018). This information enables them to

assess how the managers of the business are performing whether the business is profitable or not and whether to make drawings or put in additional capital. Customers rely on the business for goods and services. They would like to know how the business is performing and its financial position. This information would enable them to assess whether they can rely on the firm for future supplies.

Suppliers supply goods or services to the firm and would like to have information on the financial performance and position so as to assess whether the business would be able to pay up for the goods and services provided as and when the payments fall due. Managers would like to have information on the financial position, performance and changes in financial position so as to determine whether the business is operating as per the plans. Lenders would like to have information on the financial performance and position of the business to assess whether the business is profitable enough to pay the interest on loans and whether it has enough resources to pay back the principal amount when it is due (Qingliang and Luo, 2016).

Regulatory authorities assess the tax to be collected in the case there are any profits made by the business. Employees would like to have information on the financial position and performance so as to make decisions on their terms of employment. The public assesses how socially responsible is the firm. This responsibility is to inform the employment opportunities the firm offers, chariTable activities and the effect of firm's activities on the environment.

It was noted by Friedman and Miles (2002) that stakeholders influence the operations of the firms differently, depending on: a) the contract agreement existing; b) structural nature of association exists between the firm and stakeholder, and c) the organization level of help present. However, not all studies support application of this theory, with Qingliang and Luo (2016) finding little impact corporate environmental information has among the stakeholder's interest. Further, the study results showed that it's not able to explain the association between environmental disclosure as well as contextual factors.

The stakeholders theory, in regard to environmental management, is based on the premise that shareholders are as well concerned about matters of climate change, pollution as well as other negative effects on the ecology as they impact on business performance, and thus need to be accountable for (Joshi and Li, 2016; Wang, 2016; Li, Huang, Ren, Chen and Ning, 2016; Baron, 2014; Said, Sulaiman, and Ahmad, 2013). Those in charge of policymaking, more so corporate management are encouraged to show concern in ensuring a quiet and noiseless ecology since it has impeccable benefits to humanity (Mulyanto, Awatara and Gunardi, 2018; Votsi, Kallimanis and Pantis, 2017;).

One of the stakeholder theorymajor advantages is towards the provision of ways in dealing with several stakeholders having multiple conflicting interests. The theory offered a new platformwithin the context of corporate environmental disclosurestudiesthrough suggestion that the needs of shareholders cannot be achievedminus satisfying the needs of otherstakeholders (Foster and Jonker, 2005). Therefore, the stakeholder theory offers an appropriate framework towards

evaluating corporate social and ecological disclosure activities (Snider, Hill and Martin, 2003). The present research argument was based as well on stakeholder theory as is regarded being part of the positive accounting theory, that is descriptive in nature, as opposed to normative accounting theory, which is prescriptive in nature. Also, the preference of positive accounting theory is being neo-empirical research, that is, its application of empirical support in establishment of best practices derived theory (Gaffikin, 2007).

2.3.3 Agency theory

Agency Theory has been severally applied in the accounting literature in discussing and analysing corporate governance norms (Aburaya, 2012). The theory was put forward in the early 1970's by agency theorists such as Jensen and Meckling (1976), as a new economic firm theory, where the entity was defined as a nexus of agreements, in which the principal-agent agreements between shareholders and managers is a primary one. The theory seeks to examine the levels of agreements that would maximize the shareholder's utility.

An agency relationship is deemed to exist where one or more persons, the principals (s) engage another person(s), the agent(s) to carry out some undertakings on their behalf, delegating some decision-making authority to the agent(s) (Jensen and Meckling, 1976). One of the key assumptions of Agency Theory is that the needs of principals and agents mostly differ. This results in two conflicts; first, the agent and the principal have colliding aspirations. Second, the principal and the agent have varying propensities to accept risk (Jones, 1995). Further, two suggested reasons for agent failure to properly advance the interests

of the principal; moral hazard and adverse selection. “Moral hazard” existing as a result of failure on the part of the agent, and “Adverse selection” emanating where the agent does not act in a manner likened by the principal.

Jensen and Meckling(1976) further argues that based on this theory, clear distinction of ownership and management leads into agency costs classified: oversight costs, borne by the principal towards minimizing agent actions which are against the principal’s aspirations; bonding costs, borne by the agent towards guaranteeing the principal that the agent doesn’t carry out actions which are not in the principal’s interest; and, salvage costs, borne since oversight and bonding might not completely align agent character and principal’s interests. This theory is based on the precincts of “information asymmetry, opportunism, and possible conflict of interests” (Aburaya, 2012).

Agency Theory is alluded by Zahra and Peace II (1989) as the most appreciated as well as prominent perspective which has guided studies oncorporate boards. The theory suggests that within the framework of CG mechanisms, the managers have a high likelihoodof emphasizing on corporate social and ecological issues than stockholders since they have no salvage claim on anentity’s generations. The assumptions underlying corporate governance and ecologicalreporting are agency theory(Jensen and Meckling, 1976) thatcreates the framework for the connection between the variables (Odoemelam and Okafor, 2018; Kabir and Thai, 2017; Allegrini and Greco, 2013; Ienciu, Popa and Ienciu, 2012).

However, the agency theory is coupled with several shortcomings, for instance, ignores the fact that managers have significant intentions to hide bad information or even mutilate results with the aim of maximizing their benefits (Ghazali, 2007). Moreover, the theory is considered as a reason behind failure in corporate governance (Crowther and Jatana, 2005). Further, Crowther and Jatana (2005) indicates that there might be no association between the principal and agent and thus no need or even expectation that a "shareholder will remain shareholder for extended period of time".

Despite the shortcomings, agency theory provides a framework to connect corporategovernance to ecological reporting, as corporategovernance structuresare intended to check on theagency problem as well as align the interests of managementand stakeholders throughreduction of information asymmetry(Allegrini and Greco 2013). The framework suggests that the board of directorsis the ultimate internal control mechanism in terms of managers (agents) oversight on behalf of shareholders.as well as other stakeholders (Akba, 2016; Ben-Amar *et al.*, 2015; Rupley at al. 2012; Said, Zainuddin and Haron, 2009). Agency theory is among the dominant theories behind corporate ecological governance literature (Aburaya, 2012). Therefore, due to its wide application and relevance in trying to unearth the relationship between corporate governance and environmental disclosure, it was among the major theories used in the study.

2.4 Conceptual Framework

The study aimed at examining the moderating effect of financial strength on the relationship between corporate governance and environmental sustainability disclosure.The following figure, Figure 2.2, indicates the variables that wereappliedin the presentresearch towards examining the levelas well asthe value of listed firms'ecological reporting applicationstogether with their corporate sector administrationapproaches association.

The independent variable, corporate governance, is taken to represent the process of pursuing and seizing the opportunity on defined constructs. The major constructs that were applied in this study were those denoted by Gray, Javad, Power and Sinclair, (2001) that entails; board characteristics, ownership structures and internal controls. The dependent variable, environmental sustainability disclosure, included both qualitative and quantitative reporting aspects as asserted by Aburaya (2012) to be the measures of environmental disclosure. The moderating variable, financial strength, as measured by the firms' asset base,was guided by Andrews, Boyne, Law and Walker (2005) that it should meet the following two rules: they should be a representative of a certain "degree of difficulty and, must fall above firm's jurisdiction in the short-haul (however they might be endogenous in the long-haul).

The research framework suggests that financial strength, a missing link, can affect corporate ecological disclosure and further moderates the relationship between corporate governance and ecological sustainability disclosure.

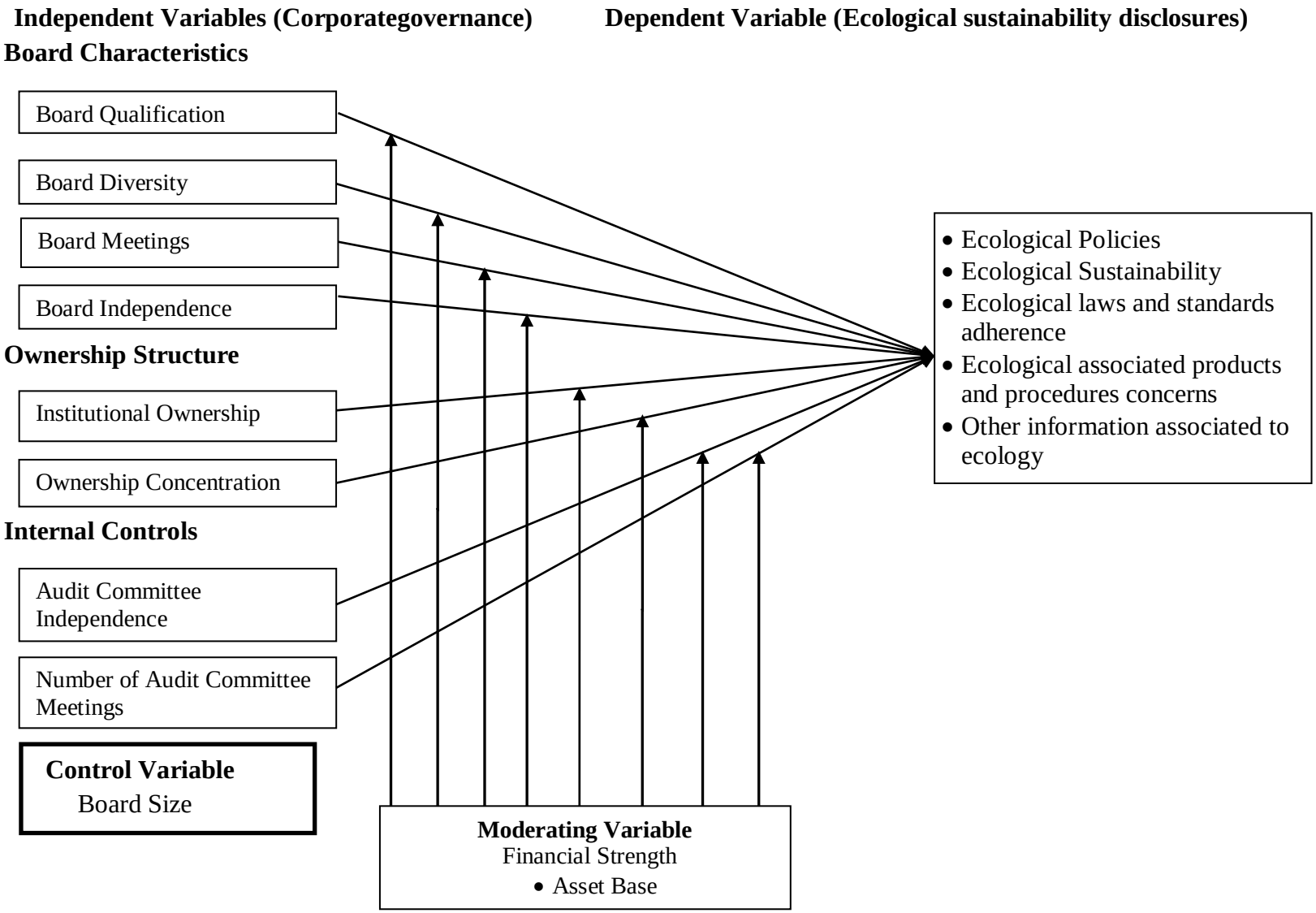

Figure 2.2:The Conceptual framework of the moderating effect of financial strength on the relationship between corporate governance and environmental sustainability disclosure

Source: Author (2018)

2.5 Identification of Knowledge Gap

A corporate environmental sustainability disclosure has been a subject of wide discussion by academic researchers in recent decades. With the development of ecological accounting and reporting, a gap has been created for research into the value relevance of ecological issues on the firm's activities. The increased need from various stakeholders on firm's being environmentally sensitive on its activities has resulted to many companies developing a "focused strategic management approach" towards ecological practices which triggers studies into value relevance quantification of environmental management systems.

However, assessment of the impact of financial strength on the corporate environmental disclosure remains vague. Various attempts have been made on the quantity disclosure, with quality disclosure having a muted attention. Nevertheless, the increasing need for narrative reporting provides a paradigm shift towards quality disclosure measurements. This, therefore, shifts the perspective of disclosure to entail not only volumetric measurement but also semantic assessment of ecological disclosure through corporate governance practices.

First and foremost, it is the limited previous research examining the specific association between both quality and quantity of corporate ecological reporting and corporate governance. Despite the fact that previous studies have appreciated that good corporate governance is related with enhanced accountability, few strides have been made towards the effect of financial strength on the relationship between corporate governance and ecological sustainable reporting. Empirical

literature reviewed evidence few studies on corporate governance and environmental sustainability disclosures doneon emerging economies.

OECD has set out the principles of proper governance in all aspects of business operation including ecological information disclosure. It requires that firm implementing OECD guidelines to incorporate a given degree of ecological disclosure. However, most of the reviewed studies on the factors leading to ecological disclosures have been based on one aspect of corporate governance mechanism (firm's characteristics), with relatively little previous research examining other corporate governance aspects. Failure to incorporate corporate governance characteristic may results in lack of harmonious and conclusive ecological reporting studies while controlling with the corporate characteristic. Thus the purpose of the study was thus to empirically evaluate the moderating effects of financial strength on the relationship between corporate governance and environmental sustainability disclosures in Kenyan listed firms at the NSE.

Several previous studies have been criticized due to the sample size being small and not heterogeneous, that is, the sample is limited in both firm magnitude and the sectoral composition. Further, some samples ignore the contribution of boards in various firms towards corporate environmental reporting. Other studies have dwelt on largest firms, or even sampling the ones that belong to ecologically sensitive sectors except for few studies. This renders their results not generalizable to the whole population as they are unreliable. To avoid such shortcomings, the current study was based on the entire population of all 65 listed

firms at the NSE. This permitted intense exploration of the relationship between corporate governance and environmental sustainability disclosures

Further, various literature reviewed has not put into cognizance the need for the study period. Many of them evaluating the factors determining ecological sustainability disclosures are majorly cross-sectional, examining the association over one period (year) only, apart from a few types of research. Longitudinal research was therefore deemed necessary to gain insights towards the trend of disclosure, the impact of financial strength on the association between corporate governance and environmental sustainability disclosures. In addressing the issue, the present study population was defined in a longitudinal way, over a 5 year period (2013 – 2017). This would help to address matters relating to causality as well as bring out more clearly on the upcoming pattern of ecological sustainability disclosures.

Finally, another concern is that most of the previous studies apply a method of estimation, OLS, which is not suitable for categorical censored information such as the one derived from content analysis. To add to that, OLS does not control for the firm characteristics such as the company size, sector as well as other important determinants of the disclosure decisions. Thus, General Least Squares (GLS) was carried out to test further the research hypotheses as well as attest the reliability of the "main OLS regression" findings. Sensitivity analysis using OLS pooled regression with robust standard error was undertaken to examine the sensitivity and thus the robustness of the main regression analysis.

The main contribution of the present study was that being the first study in Kenya to empirically look at firm's ecological reporting quantity measurement as well as quality assessment based on the international financial reporting standards framework, together with global reporting initiatives guidelines. With few studies on ecological disclosure quantity and quality assessment,it remains an unexplored area, coupled with other literature gaps identified that necessitated the present study. While several studies having been carried out in developed countries, it is particularly important because the results obtained from developed economies may not necessarily be generalized in developing economies like Kenya due to the varying landscapes in terms of bureaucratic, cultural, technological and social factors.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter explains the methodology used to achieve the research objectives; how data was analysed and presentedin regard to moderating corporate governance and environmental sustainability disclosures on all listed firms at the NSE. It entailed research design, location of the study, study population, sampling procedures, data collection instruments, data collection procedures, data analysis and presentation, and ethical consideration.

3.2 Research Design

The research methodology is the process used to collect information and data for the purpose of making business decisions and the methodology may include publication research, interviews, surveys, and other research techniques, and could include both present and historical information (Business Dictionary, n.d.). This process includesseveral steps that can be observed as layersof research onion as indicated in figure 3.1. A research onion provides an effective progression through which a research methodology can be designed (Saunders, 2016).

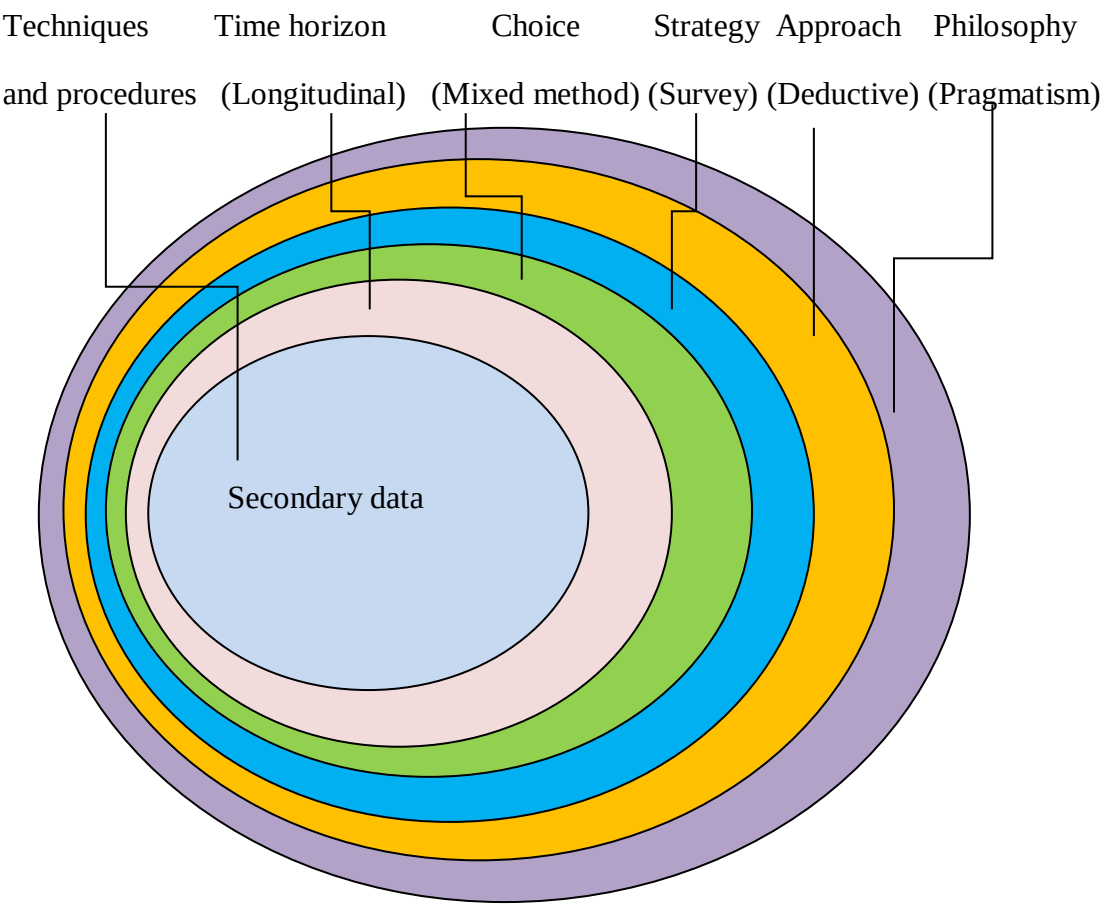

Figure 3.1: The Research 'Onion'

Source: Adapted from Mark Saunders, Philip Lewis and Adrian Thornhill (2015)

Research philosophy is a set of beliefs regarding the nature of reality or knowledge under investigation, providing the justification on research undertaking (Bryman. 2012, Flick, 2011). From Figure 3.1, the study employed pragmatism philosophical approach grounded on the assumption that research starts with a problem, and aims to contribute practical solutions that inform future practice. Further, it buttresses the view that in undertaking pragmatist research,

the most important determinant for research design and strategy would be the research problem that needs to be addressed, as well as research question (Saunders, 2016).

For the research approach, the study adopted a deductive approach it entailed the development of various research hypotheses and statistical testing on the relationship between corporate governance and environmental sustainability disclosure. The approach was appropriate in examining the fitness of the observed phenomenon in regard to the expectations (Saunders, 2016; Silverman, 2013; Snieder and Larner, 2009).

On the research choice, the study employed a mixed-method approach because it used both quantitative data and qualitative data. This provided a better understanding of the research problem than either approach alone (Leech and Onwuegbuzie, 2008). In regard to the time horizon,the study applied longitudinal time horizon data collection, repeatedly over five years period (2013 to 2017) (Goddard and Melville, 2004). This enabled to examine the moderating impact relationship change between corporate governance and environmental sustainability disclosure.

A research design is a laid down blueprints which are embracedin studies in order to provide solutions to querieswithout bias, sharply, financiallyas well as with relevance (Sekaran, 2000). It's a grand plan of approach towards a research topic (Greener, 2008; Babbie and Mouton, 2007). A panel research design within the domain of correlational survey design method was applied on a panel data over a

period of 5 years (2013-2017). Anazonwu, Egbunike, and Gunardi (2018) alluded that panel research designs are particularly stronger in addressing the “threats of unit heterogeneity and temporal instability” (Halaby, 2003; Hsiao, 2003) and thus deemed appropriate for cause and effect researches. The panel data enabled the researcher to control omitted variables by observing changes in the predicted variables over time, therefore reducing heterogeneity and temporal instability threats (Mahmood and Orazalin, 2017; Halaby, 2003), as well as their suitability for cause and effect researches (Anazonwu, Egbunike and Gunardi, 2018).

Correlational researches display the association between variables through for instance correlations and cross-tabulation techniques, (Chepkwony, 2017) and thereafter deriving a regression model meant to predict about the population. This design is appropriate in ascertaining the way and magnitude of association between the variables (Onuorah, Egbunike and Gunardi, 2018). This study sought to establish the moderating effect of the correlation between corporate governance and environmental sustainability disclosures, and thus the correlational research design was applied due to its appropriateness. The level of association between variables determines how closely related they are (Simon, 2011). The longitudinal analysis assisted in addressing matters relating causality as well as shedding more light regarding evolving trends of the ecological disclosures (Brammer and Pavelin, 2006).

Several studies have utilised this research design as an appropriate method in establishing the association between corporate governance and environmental sustainability disclosure (Ribeiro andAibar-Guzman, 2010; Qian and Burritt,

2007; Leng and Ding, 2011; Haniffa and Cooke, 2002). Babbie and Mouton (2007), Sekaran (2000), Ryan, Scapens and Theobold (2002), assert that the strength of quantitative research approach lies in its precision and reliability in data collection and quantitative measurement and control through the sampling and sampling techniques. With the deductive approach study, involving testing of hypothesis, it permits conducting of statistical analyses and therefore providing answers with much more strong foundation than a 'layperson's common sense, intuition or opinion' (Cooper and Schindler, 2004; Welman, Kruger and Mitchell, 2005). In addition, the time horizon involved a longitudinal as it covers a period of 5 years (2013 – 2017).

3.3 Location of Study

The study was done at the Nairobi Securities Exchange (NSE) listed firms in Kenya (Nairobi Securities Exchange, 2018), as indicated in the appendices XI.The firms are situated across the country. They are public in nature as they trade their securities at the Nairobi Securities Exchange market and have public participation.

3.4 Target Population

The study involvedall65 listed firms at the Nairobi Security Exchange (NSE) during the financial year 2017/2018 (NSE, 2018; Cheruiyot, 2017). Due to their public nature of operations, they are expected by the stakeholders (and especially the government through various established oversight authorities such as Capital Market Authority, Institute of Certified Public Accountants of Kenya, National

Environmental Management Authority, among others) to uphold high standards of corporate governance in order to safeguard the stakeholder's interests. Using the earlier research studiesas well asseveral press released informationtogether withopen accessfiles, the study evaluated the reports meant to focus on ecological sustainability practices on corporate governance mechanisms (Preston and Jones, 2006; Friedman and Miles, 2001; ACF, 2006; Thompson and Cowton, 2004;Stern, 2006; Pinkse and Kolk, 2007;Boykoff and Roberts, 2007; KPMG, 2008a;Hall and Taplin, 2007; Haque, 2011; Garnaut, 2008; Deegan, 2010; Solomon, 2010).

3.5 Sample Size and Sampling Procedures

From the target population of 65 listed firms (NSE Handbook, 2018; Cheruiyot, 2018), the purposive sampling method was used to determine the sample size. The purposive sampling method is considered more appropriate when the populationtends to be small with known features of it and is to be carried out intensively (Kothari, 2004).A sample size of 56 firms was selected based on the firms' provision of environmental-related information in their annual reports, ecological stand-alone reports, website, newsletters, and any other secondary source. For those that did not provide were eliminated. The reports of the sampled firms were evaluated from 2013 to 2017; five years period that has witnessed increased appreciation and embracement of the need for corporate governance practices.

The preference of a large as well as industrially diverse sample size gives room for a wider comprehensive exploration together with analysis of the association in question (Brammer and Pavelin, 2006). Further, the incorporation of all sectors representing various firms with different forms of ecological sensitivity potentially allows much more generalizability of the findings (Aburaya, 2012). The sample size cut across the Main Investment Market Segment (MIMS) firms as well as the Alternative Investment Market Segment (AIMS) firms. All sectors were studied in line with the Kenya green bonds programme, that has earmarked all of them have in one way or another contributeddirectly or indirectly towards emissions of carbon due to their activities coupled with immense negative effects on environmental sustainability (Kenya Bankers Association (KBA), Nairobi Securities Exchange (NSE), Climate Bonds Initiative (CBI), Sustainable Finance Initiative, 2017).

3.6 Data Collection Instruments

3.6.1 Validity of the Instruments

Sekaran (2003) argued that validity represents an evidence that the instrument, technique or process applied towards measuring a concept does indeed measure the intended concept. Content validity of the research instrument was achieved through careful definition of the research phenomena under study, that is, corporate ecological reporting practices in Kenya listed firms. Further, regarding ecological reporting literature and disclosure guidelines, content validity was also examined through the use of a panel of expert judges. Academics were asked to refine the preliminary checklist, with the guidance of the Global Reporting

Initiative (GRI, 2011), one of them having considerable practical accounting and auditing experience with Kenyan listed firms.

On the disclosure indices, content validity and construct validity were used. Content validity, meant to ensure that the measure includes an adequate and representative set of items that tap the concept, involved careful definition of the research phenomena under examination through detailed review of the literature as well as the use of a panel of expert judges. Construct validity, which focuses on consistency with theoretical expectations and evidence from literature, was achieved by means of correlation analysis (Cheng and Courtenay, 2006; Aburaya, 2012).

3.6.2 Reliability of the Instruments

Aburaya (2012) asserted that the reliability of secondary data instrument is assured through verification or auditing. In this study, reliability was determined through carrying out a pilot study on a sample of end year reports of 25 firms for the year 2017. Thereafter, content analysis of the end year reports used in the pilot study was conducted twice at different dates to test for stability aspect of reliability as well as face validity of the numerical findings arrived at. Then, inter-coder reliability meant to test the reproducibility form of reliability was enhanced through evaluation of some end year reports by two coders; the researcher as well as an independent coder. This was intended to minimize any ambiguity and overlapping of meanings or interpretations. Finally, decision rules were established and revised to facilitate codifying data gleaned from content analysis of annual reports.

Checklist

This represents a set of qualitative and quantitative items expected to be disclosed in the firm end year report relating to ecological sustainability information. The content analysis study entailed various varieties of ecological reporting hand in hand with the most appropriate data items in the said classification, which entailed the use of a reporting checklist. The checklist incorporates as much as possible all corporate ecological reporting ways in the end year reports. The development of checklist was guided from previous studies done on corporate ecological reporting practices (Cormier *et al.,* 2011; Clarkson *et al.,* 2008; Cormier *et al.,* 2005;Cormier and Magnan, 2003) as well as guidelines incorporated in the Global Reporting Initiative (GRI) (GRI, 2011).

The checklist consisted of 31 ecological information items categorized under five segments as follows: 1) Ecological policies; 2) Ecological sustainability; 3) Ecological laws and standards adherence; 4) Ecological associated products and procedures concerns; and 5) Other information associated to ecology (Clarkson, 2008; Aburaya, 2012). The said five categories are also expanded into various information units as indicated in the *Appendices II and IX*.

Dichotomous scores were used in examining the presence or absence of the different items of the checklist using binary codes for the ecological quantity disclosures. The presence or disclosure of the ecological information was denoted by one (1), while the absence of non-disclosure of the ecological information was denoted by zero (0). Upon all items necessary have been captured in the checklist,

a coding procedure was undertaken for assignment of every environmental sustainability information activity in the end report towards respective checklist items, based on predetermined rules. Thereafter, scores were computed on each disclosure group together with the total environmental sustainability disclosure, from which a sustainability disclosure index was carried out for further data analysis purposes. Throughout these processes, the validity and reliability of reporting measurements were ascertained. Previous

FASB and GRI on the ecological disclosure quality indicate that the analysis of corporate disclosure needs to look on both "what was said and how it was said". This involves not only counting the number of disclosures but also assigning them weights based on the type of information disclosed and defining scores that differ based on the nature of the disclosure items (Aburaya, 2012; Bozzolan, Trombetta and Beretta, 2009). For the appendix VIII, more weights were assigned to the financial quantitative (3) contrary to non-financial quantitative (2) or declarative (1); good (2) or bad (2) viz a viz neutral (1); forward-looking (2) in comparison to historical (1); and verifiable (2) viz a viz non-verifiable (1) information. Past studies have indicated that this type of information is most probably to enable the shareholders have a better opinion as well as enhanced credibility of a company's disclosure in regard towards overall value creation.

Inter-coder reliability was enhanced through examining some annual reports by two coders; researcher and independent coder. This was meant to ensure accuracy and consistency (Sekaran, 2003). The decision rules were established and revised to facilitate codifying data gleaned from content analysis of annual reports. The

multi-coder perspectives were captured in order to minimize any ambiguity and overlapping of meanings or interpretations. Minor variations and disagreements between the two coders; researcher and independent coder, were found mainly as a result of items not counted among disclosures. Differences in the coding process between the two coders were then discussed to reach a consensus and inconsistencies are reconciled. In this respect, the objectivity and reliability of the coding process was greatly enhanced (Adeniyi and Fadipe, 2018; Van Der Ploeg and Vanclay, 2013).

Secondary Data

Quantitative, as well as qualitative secondary data, was adopted for this study. The method needs "the application of standardized mechanisms in order for the differing perceptions as well as level of people experiences can be fit into a limited number of predetermined response classifications to which figures are apportioned" resulting in "a wide, generalizable set of outcomes"(Patton, 2002). For the quantitative secondary data, a data collection matrix developed was used. It incorporates the three corporate governance measurement variables namely; board characteristics, ownership structures, and internal controls. In addition, it also includes the moderating variable (financial strength) as shown in *Appendix I*.

Even though quantitative research secondary data are normally regarded quick as well as cost-effective since the required statistics can be summed up from big sample sizes, they are however not flexible as well as natural. The data findings in most instances indicate meanings which came out from the beliefs and

perspectives of the individual(s) undertaking the research instead of the respondents. In addition, it does not give effective comprehension of the methods or the necessity stakeholders associatedwith behavior irrespective of the enlarged coverage of the situational dimensions (Aburaya, 2012).

Secondary data, therefore, entailed the end year annual reports, firm's website information available, stand-alone environmental-related reports and any other authenticated information, such as from the published journals and magazines. The validity and reliability of secondary data was assured through auditing as espoused by several studies (Aburaya, 2012;Ofoegbu, Odoemelam and Okafor, 2018). The annual reports used were duly audited and unqualified reports issued by the external auditors.

Annual Reports

An annual report is a source of subsidiary data that was used in this study to assess ecological reporting practices of selected NSE listed firms in Kenya over a span of five years; 2013 to 2017. Annual reports are the most paramount media platform where a company discloses its corporate information to the public (Ponnu and Okoth, 2009),notwithstanding being the common corporate communication channel with regard to social and ecological information (Van der Laan Smith, Adhikari and Tondkar, 2005*;* Gibson and O'Donovan, 2007).

For Wilmshurst and Clift (2011), Beattie, Dhanani and Jones (2008), they asserted that annual reports are the most common disclosure media, especially on the disclosure structure and size. Corporate ecological issues are well magnified in

the annual reports by tackling ecological concerns as well as different stakeholder's interest. Therefore, annual reports represent one of the most appropriate media of communication to the stakeholders which lime with the stakeholder theory as espoused by Van der Laan Smith *et al.*, (2005). Therefore, the annual reports were applied one of "the most reliable" medium of corporate ecological information disclosure (Aburaya, 2012).

3.7 Data Collection Procedures

Content analysis was applied by the study. Content analysis "involves codifying non-monetary as well as monetary data to a prior determined class so as to come up with series towards showing as well as data disclosing" (Guthrie and Abeyeskera 2006; Guthrie,Petty, Yongvanich and Ricceri, 2004).The present study concentrated towards 'amount of reporting' as an indicator towards gathering information. Thedisclosure quantity was captured by ticking the appropriate item on the checklist, as the disclosure quality was recorded for the items ticked thorough assessmentas well ascapturing each of its non-monetaryfeatures or quality-component indicators. The form's content was thereaftermoved into a data-sheet in the form of acomputerized Excel document.

The filled data in the Excel document was crosschecked against thedata captured manually on towards ensuring that the entry process was properlyachieved free from errors. The capability of Microsoft Excel, mathematically, was used to come up with sums of each ecological reporting category together with the total ecological reporting score and to compute the disclosure indices.Sustainability

Disclosure Index (SDI) was applied that capture the availability of sustainability reporting as well as their length (amount of things reported), independent of their coverage, in-depth, breadth among other determinants. The index has been applied in other previous studies (Monteiro and Guzmán, 2010; Eze and Oyandonghan, 2013).The Environmental Accounting Disclosure Index (EADI) consisted of five categories of environmentally related disclosure items as indicated in appendix II.

For the ecological quantity disclosure, items was assigned a value which oscillates between zero and one according to the following criterion: the value of zero (0) assigned if the analysed company does not disclose environmental information on the said items in its reports a well as the value of one (1) assigned if the firm discloses environmental information on the item in question. For the ecological quality disclosure, appendix VIII indicates on how weights for the 31 ecological information was assigned as follows; financial quantitative (3) contrary to non-financial quantitative (2) or declarative (1); good (2) or bad (2) viz a viz neutral (1); forward-looking (2) in comparison to historical (1); and verifiable (2) viz a viz non-verifiable (1) information.

A disclosure sub-quality indices were established where a sum of the sub-quality score was given to every ecological reporting group in the checklist through summing the sub-quality scores of all items within the group. A sum of the sub-quality score was also given to total corporate ecological reporting by summing the sub-quality scores of all reporting groups so as to come up with an aggregate sub-quality score for the firm. The maximum applicable sum sub-quality scores

which a firm was expected to earn for the highest quality disclosure of 31 items are 93, 62, 62, and 62 for each of Kind, Direction, Outlook, and Validity respectively. Reporting sub-quality indices were thereafter calculated as the percentage of the sub-quality score awarded to maximum applicable sub-quality score. Nevertheless, overall reporting quality indices were calculated as the arithmetic mean of the four sub-quality indices.

3.8 Data Analysis and Presentation

Descriptive statistics, inferential statistics, and content analysis were used. Inferential statistics were used in statistical data analysis. Both parametric and non-parametric test techniques such as Jarque-Bera tests, Shapiro Wilk tests were used to test data normality. Pearson correlation was used in testing collinearity. Ordinary Least Squares (OLS) multiple regression was applied in hypothesis testing. As explains by Eze and Oyandonghan (2013), Gujarati and Porter (2009), the OLS analysis indicates the direction of causing and affecting between the regress and the regressor variables. In addition, Hausman test was carried out to examine if the Fixed Effect or Random Effect regression was to be usedin testing the null hypothesis that the coefficients approximated by the random effects approximator are the same as the coefficients approximated by the consistent fixed effects approximator (Anazonwu, Egbunike and Gunardi, 2018; Hajek *et al.*, 2015). The study applied fixed effects estimator that was built on the error components model shown below:

$$Y_{it} = X_{\mathrm{it}}\beta + \propto_{\mathrm{i}} + \boldsymbol{\varepsilon}_{\mathrm{it}}$$

Where y_{it}represented the observed outcome of an entity$_i$ at period$_t$, $x_{it}$was the (1 × K) vector of covariates of theentity measured contemporaneously, as well as β being the corresponding (K × 1) vector of parameters to be estimated. The error term of the model was divided into two components. The $\alpha_i$was stable firm-specific features which are often unobserved, even though they are very often associated with the covariates. Thus, the $\alpha_i$were unobserved effects capturing time-constant firm heterogeneity. The other component $\varepsilon_{it}$was an idiosyncratic error that differsacross firms and over period.One-way analysis of variances (ANOVA's) was used to examine mean differences from more than two groups and identify any significant differences between these groups.

In addition, GLS regression was undertaken to further test the research hypotheses and to attest the reliability of the main OLS regression results. Finally, a sensitivity analysis using Ordinary Least Squares (OLS) pooled regression with robust standard error was carried out to check the sensitivity and, hence, the robustness of the main regression analysis.

Descriptive statistics of the data gathered was calculated for each of the dependent, independent and moderator variables. A Pearson correlation was carried out to identify the correlation between the dependent and independent variables. Correlation coefficients were used as a check for multicollinearity, in addition to Variance Inflation Factor (VIF) test. Ordinary Least Squares (OLS) cross-sectional panel regression analysis was undertaken to identify the association between corporate environmental disclosure and corporate governance while moderating for asset base. The model was tested in which the dependent

variable was total corporate environmental sustainability disclosure. The independent variables were corporate governance mechanisms with the moderator variable being the asset base. Data was paneled according to time or the five years examined, 2013-2017 inclusive. Longitudinal panel data are better able to identify and measure effects that are simply not detectable in pure cross-section or pure time-series data. In addition, they aid inproviding accurate results as well as avoiding different measurement problems on the said relationship(Anazonwu, Egbunike and Gunardi, 2018). Research hypotheses were mainly examined using OLS. However, GLS regression was undertaken to further test the research hypotheses and to attest the reliability of the main OLS regression results. In addition, a pooled ordinary least square (OLS) regression was applied in comparison to the panel regression as it deals with the whole observations as one unit with the same intercept and same error distribution. The standard error robust regression test was used if the data was not normally distributed. The data were analyzed at confidence levels of 95%, and 90%.

The following modelwasestablished towards measuring the aggregate quantity of corporateecological reporting and ecological disclosure category on every reporting class in the model.

Model

$$ESD_{it} = \beta_{0it} + \beta_{1ait}BI_{it} + \beta_{1bit}BD_{it} + \beta_{1cit}BQ_{it} + \beta_{1dit}BM_{it} + \beta_{2ait}IO_{it} + \beta_{2bit}CO_{it} + \beta_{3ait}ACS_{it} + \beta_{3bit}ACI_{it} + \boldsymbol{\varepsilon} \ldots\ldots\ldots\

To determine the presence of moderation, the following equation was compared with the moderated multiple regression model as shown below

$$ESD_{it} = \beta_{0it} + C + \varepsilon \ldots\ldots\ldots\

ACM = Audit Committee Meetings;

ACI = Audit Committee Independence;

M = a hypothesized moderator (Financial Strength);

BQ*M=Interaction between predictor (Board Qualifications *Asset Base);

BD*M =Interaction between predictor (Board Diversity *Asset Base);

BM*M=Interaction between predictor (Board Meetings *Asset Base);

BS*M =Interaction between predictor (Board Size *Asset Base);

IO*M=Interaction between predictor (Institutional Ownership *Asset Base);

OC*M=Interaction between predictor (Ownership Concentration *Asset Base);

ACI*M=Interaction between predictor (Audit Committee Independence*Asset Base);

ACM*M=Interaction between predictor (Audit Committee Meetings *Asset Base);

β_0 = the intercept of the line-of-best-of-fit which represents the value of Ywhen X = 0 (constant term);βi = 1,2,3,4,5,7,8,9,10,11,12,13,14,15,16,17,18 = the least-squares estimate of the population regression coefficientfor BQ, BD, BM, BS, RD, IO, OC, ACI, ACM, M, and the interaction term;

ε_i = the error term.

Detailed presentation of the decision rules for independent variables data feeding into the respective regression model variables is shown in *Appendix VII*.

Content analysis was applied to non-monetary items. The study made inference through non-bias as well as thoroughly evaluating specific non-monetary features by compressing a lot of text words to less as well as particular content classification built on "explicit rules of coding"(INTOSAI (2013); NIVRA (2008); Krippendorff, 2004). Even though sustainability data might entail monetary data, sustainability disclosure applications indicate only trivial application of financial amounts in reporting (Guthrie and Farneti, 2008). Content analysis "involves codifying non-monetary as well as monetary data to a prior determined class so as to come up with series towards showing as well as data disclosing" (Guthrie and Abeyeskera 2006; Guthrie,Petty, Yongvanich and Ricceri, 2004).

For the ecological quantity disclosure, items was assigned a value which oscillates between zero and one according to the following criterion: the value of zero (0) assigned if the analysed company does not disclose environmental information on the said items in its reports a well as the value of one (1) assigned if the firm discloses environmental information on the item in question. Therefore, the Environmental Disclosure Index (EDI) was measured as follows:

$$\text{EDI}i = \sum_{j=1}^{e} ej/e$$

Where:

EDI*i* = Environmental Disclosure Index of Company i.

ej = Environmental item *j*. Dummy variable, whose value is 1 if the company discloses information about this item and 0 if the firm does not disclose information about it.

e = Maximum number of items.

For the ecological quality disclosure, appendix VIII indicates on how weights for the 31 ecological information was assigned as follows; financial quantitative (3) contrary to non-financial quantitative (2) or declarative (1); good (2) or bad (2) viz a viz neutral (1); forward-looking (2) in comparison to historical (1); and verifiable (2) viz a viz non-verifiable (1) information.

A disclosure sub-quality indices were established where a sum of the sub-quality score was given to every ecological reporting group in the checklist through summing the sub-quality scores of all items within the group. A sum of the sub-quality score was given to total corporate ecological reporting by summing the sub-quality scores of all reporting groups so as to come up with an aggregate sub-quality score for the firm. The maximum applicable sum sub-quality scores which a firm was expected to earn for the highest quality disclosure of 31 items are 93, 62, 62, and 62 for each of Kind, Direction, Outlook, and Validity respectively. Reporting sub-quality indices were thereafter calculated as the percentage of the sub-quality score awarded to maximum applicable sub-quality score. Nevertheless, overall reporting quality indices were calculated as the arithmetic

mean of the four sub-quality indices. Corporate ecological reporting sub-quality index for each firm was, therefore, calculated by applying the following equation.

$$\text{EDI Sub-Quality} = \frac{\sum_{j=1}^{e} Sub\text{-}Quality_j}{\text{MAX Sub-Quality}}$$

Where:

EDI Sub-Quality= Environmental Disclosure Sub-Quality Index of a firm,

Sub-Quality j = scoring scale for each sub-quality was applied to item *j*,

MAX Sub-Quality = maximum applicable disclosure sub-quality score,

e = Maximum number of items.

Strata, Statistical Program for Social Sciences (SPSS-Version 21) and Microsoft Excel was used as an aid in data analysis. Analysed data was presented using Tables, diagrams and charts.

3.8.1 Diagnostics Tests

Prior to selecting which panel regression model to use, and in order to identify potential endogenous variables, some robustness testshave to be carried out, such as normality tests, multicolinearity, unit root test, test for heteroskedasticity , autocorrelation test and specification error test.

3.8.2 Normality Tests

For the Jarque-Bera Test, if the p-value is lower than the Chi-square value, then the null hypothesis cannot be rejected. It can, therefore, be concluded that the residuals are normally distributed. As per Table3.1, the chi (2) is .5633 which is greater than .05 meaning that the null hypothesis cannot be rejected. The implication is that there is no violation of the normal distribution assumption of error terms as the residuals are coming out to be normal.

Table 3.1

Jarque-Bera test for Normality

Skewness/Kurtosis tests for Normality

				------	point	-----
Variable	**Obs**	**Pr(Skewness)**	**Pr(Kurtosis)**	**Adj**	**chi2(2)**	**Prob>chi2**
Myresiduals	280	0.7785	0.307		1.15	0.5633
Jarque-Bera		normality test: 6137 Chi(2), .7358				
Jarque-Bera		test for Ho: normality:				

Source: Research data (2019)

Shapiro Wilk Normality test was also used to test the assumption of normality. As depicted in Table3.2, the p-values of the Shapiro-Wilk's tests are computed under the assumption that the residuals show normal distribution. Since the p-value (.0514) is larger than .05, the hypothesis of normality cannot be rejected.

Table 3.2

Shapiro-Wilk W test

Shapiro-Wilk W test for normal data					
Variable	**Obs**	**W**	**V**	**Z**	**Prob>z**
Myresiduals	280	0.96892	3.822	3.05	0.0514

Source: Research data (2019)

3.8.3 VIF Test for Multicollinearity

Multicollinearity is a phenomenon whereby a high correlation exists between the independent variables. It occurs in a multiple regression model when high correlation exists between these predictor variables prompting questionable assessments of regression coefficients. This leads to strange outcomes when attempts are made to decide the degree to which the independent variables explain the changes in the outcome variable (Creswell, 2014).

The outcomes of Multicollinearity are expanded standard errors of evaluations of the Betas, which means diminished reliability quality and misleading results. Multicollinearity test was used to check whether high correlation existed between one or more variables in the study with one or more of the other independent variables. Variance inflation factor (VIF) measured correlation level between the predictor variables and estimated the inflated variances due to linear dependence with other explanatory variables. A common rule of thumb is that VIFs of 10 or higher (conservatively over 5) points to severe multi-collinearity that affects the study (Odoemelam and Okafor, 2018). The results of the VIF test as shown in Table3.3 ranged between 1.2 and 2.04. All the variables are less than 10 thereby; our model does not suffer from multicollinearity problems.

Table 3.3

VIF test for Multicollinearity

Variable	VIF	1/VIF
Bi	2.04	.490607
Acm	1.9	.525196
Fs	1.84	.543997
Bm	1.75	.572232
Bs	1.68	.594719
Aci	1.59	.627836
Oc	1.41	.710181
Bq	1.33	.754666
Bd	1.21	.826748
Io	1.2	.834352
Mean VIF	**1.59**	

bi = board independence, bd = board diversity, bq = board qualifications, bm = board meetings, oc = ownership concentration, io = institutional ownership, aci = audit committee independence, acm = audit committee meetings,fs = financial strength, bs = board size

Source: Research data (2019)

3.8.4 Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity

To conduct the heteroskedasticity test, this study used the Breusch-Pagan test for heteroskedasticity. The findings indicated that Chi2 (1) was .29, p-value of .5901 revealing that null hypothesis was not rejected suggesting that assumption of constant variance was not violated. Findings are presented in Table3.4.

Table 3.4

Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of fns
chi2(1) = .29
Prob > chi2 = .5901

Source: Research data (2019)

3.8.5 White's Test for Homoskedasticity

The study tested Homoskedasticity using White test. The findings indicated that Chi2 (35) was 52.47, p-value of .0592 revealing that null hypothesis was rejected suggesting that assumption of Homoskedasticity was not violated. Findings are presented in Table3.5.

Table 3.5

White's test for Homoskedasticity

White's	**test for Ho:**	**Homoskedasticity**
	against Ha:	unrestricted Heteroskedasticity
	chi2(35)	52.47
	Prob > chi2	.0592

Source: Research data (2019)

3.8.6 Wooldridge Test for Autocorrelation

Autocorrelation in panel data can be detected using several tests such as the Baltagi-Wu test, Durbin-Watson test, and the Breusch-Godfrey test. According to Drukker (2003), these tests employ many specification assumptions such as individual effects types, need for non-stochastic regressors and inability to work in the presence of heteroscedasticity. Drukker (2003) further argues that the autocorrelation test of Wooldridge (2002) does not have such limitations and can also deal with unbalanced panel data with and without gaps in the observations.By the *p-values* in Table3.6, the null hypothesis cannot be rejected at the 5% significance level, which means that there is no autocorrelation in the data.

Table 3. 6

Wooldridge test for autocorrelation

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F(1, 55) = 3.668
Prob > F = .0607

Source: Research data (2019)

3.8.7 Unit Root Test

A time- series is said to be stationary if its mean and variance are constant over time (Gujarati, 2004). Thus, the series will tend to drift around its mean due to the limited variance. The series can be of a stochastic nature (randomly determined) or a deterministic nature (displaying a trend). In contrast, a non-stationary time–series or a random walk model is one where the mean and variance continually change over time and has a simple correlation coefficient between the *X* variable and its lagged variable which is influenced by factors other than solely the length of the lag between the two (Studenmund, 2011).In the field of economics and finance, time related or seasonal shocks in one time period may strongly influence subsequent periods.

Table 3.7

Unit root test

	Fisher-type unit-root test				
	Inverse chi-squared(58)	**Inverse normal**	**Inverse logit t(144)**	**Modified inv. chi-squared**	**Harris-Tzavalis unit-root test**
	P	**Z**	**L***	**Pm**	**Rho**
esd	44.79	-9.95	-15.72	21.97	-.04
p-value	.00	.00	.00	.00	.00
bi	44.43	-7.78	-15.40	21.94	-.03
p-value	.00	.00	.00	.00	.00
bd	50.22	-9.03	-18.46	25.94	.04
p-value	.00	.00	.00	.00	.00
bq	199.36	-.89	-4.09	5.84	-7.00
p-value	.00	.19	.00	.00	.00
bm	399.04	-5.78	-12.82	19.18	-9.28
p-value	.00	.00	.00	.00	.00
oc	509.96	-7.41	-16.46	26.59	-.10
p-value	.00	.00	.00	.00	.00
io	207.03	-1.91	-6.21	6.35	.08
p-value	.00	.03	.00	.00	.00
acm	245.89	-2.22	-6.97	8.95	-6.49
p-value	.00	.01	.00	.00	.00
aci	264.61	-3.03	-7.19	1.20	.04
p-value	.00	.00	.00	.00	.00
fs	574.31	-8.72	-17.45	3.89	-.11
p-value	.00	.00	.00	.00	.00
bs	209.07	-3.06	-6.68	6.49	.04
p-value	.00	.00	.00	.00	.00

esd = Environmental sustainability disclosure, bi = board independence, bd = board diversity, bq = board qualifications, bm = board meetings, oc = ownership concentration, io = institutional ownership, aci = audit committee independence, acm = audit committee meetings,fs = financial strength, bs = board size

Source: Research data, 2018

This current study applies Fisher and Phillips- pheron test. The following hypothesis was considered for this test.

Null hypothesis (Ho): All panels contain unit root.

Alternative hypothesis (H1): At least one panel is stationary.

For the *p*-values in Table3.6, the null hypothesis can be rejected at all conventional significance levels for all the variables of the study, which means that there is no unit root in our data. This implies that the means and variances in our data do not depend on time; hence the application of OLS can produce meaningful results (Guajarati, 2012).

3.9 Ethical Considerations

All information to be collected wastaken as privateonprecinctslaid out by the necessity to give a relevantas well asa detailedmethodology reportwhererespondents"implicitly" agreed to participate. Ensuringunknown partieswasimportant.

Before embarking on data collection, clearance form wasobtained from the firms listed in NSE, National Commission for Science, Technology and Innovation (NACOSTI), the body in charge of certifying academic dissertation, as well as the police for institutional and security consent purpose.

The researcher's vital details pertaining to data collection, information required from the respondents as well as data application was clearly stated to them in order to ensure that they had informed consent before and after response. The study also ensured the confidentiality of the data collected.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents analysis of the findings of the study as set out in the research objective and research methodology.The results presented here are organized under eight key sections: descriptive statistics, diagnostic tests, correlation analysis, fixed and random effect, Hausman test, and hypothesis testing and moderation results.

4.2 Presentation of the Results

4.2.1 Corporate Governance and Environmental Sustainability Disclosures

4.2.1.1 Board Characteristics

The board is responsible for reviewing the performance of the firm and ensuring good management practices. As such, the study deemed it important to establish board characteristics. Emphasis was on board independence, board diversity, board qualification, board meeting and board size. Table 4.1 illustrates the findings. Evidently, in 2013, 68% of the members on the board were non-executive directors while board diversity was at 18%. Further, the board was comprised of 8 members. The board had 4 meetings per year with board qualification at a mean of .26. In addition, in 2014, the board was composed of 8 members with 4 meeting in a year. Board diversity was at 21% with 68% of the members in the board being non-executive directors. On the other hand, board qualification was at a mean of .28.

Furthermore, board independence was at 70% in 2015 while board diversity was at 18%. In the same year, the board was composed of 8 members with at least 4 meetings in a year. Moreover, board qualification was at a mean of .25.In 2016, the percentage of non-executive directors in the board was at 77%. Overall, there were 8 members in the board with board diversity at 16% and board qualification at a mean of .33. The board had 5 meetings in a year.Finally, in 2017, there were 8 members on the board with 79% of them being non-executive directors. Board diversity was at 17% while the Board qualification stood at a mean of .33. On average, the board had 6 meetings in a year.

On the board independence, the findings indicated an increase in the number of non-executive directors in the board over the five years period from 2013 to 2017. For the board diversity, the results observed a general decrease in number of female directors in the firms' board of directors except in the year 2014. In regard to the board qualification, the results showed that there was a rise in the number of directors who had possessed any finance and/or accounting background, except in the year 2015. On the board meetings, the mean number of meetings has steadily increased from 2013 to 2017 except in the year 2015.

In a nutshell, there was a statistically significant difference in board independence between 2013 to 2017 for the firms listed in NSE ($F= 3.03$, $\rho=.02<.05$). Similarly, the change in the number of board meetings held by the board during the study period is statistically significant ($F= 5.24$, $\rho=.00<.05$). However, the change in board diversity ($F= 3.03$, $\rho=.62>.05$), board qualification ($F= 1.60$, $\rho=.18>.05$)

and board size (F= .21, ρ=.93>.05) between 2013 to 2017 was not statistically significant.

Table 4.1

Board Characteristics

Year	Statistics	Board Independence	Board Diversity	Board Qualification	Board Meeting	Board Size
2013	Obs	56	56	56	56	56
	Min	0.1	0.2	0.01	1	2
	Max	1	0.58	0.82	16	15
	Mean	**0.68**	**0.18**	**0.26**	**4.2**	**8.27**
	p50	0.8	0.14	0.21	4	8
	Skewness	-1.29	0.94	0.5	1.15	-0.66
	Kurtosis	3.28	2.99	2.32	5.51	3.88
2014	Obs	56	56	56	56	56
	Min	0.1	0.2	0.01	1	2
	Max	0.92	0.59	1	14	15
	Mean	**0.68**	**0.21**	**0.28**	**4.41**	**8.61**
	p50	0.79	0.2	0.26	4	8.5
	Skewness	-1.3	0.59	0.65	0.61	-0.36
	Kurtosis	3.44	2.66	2.79	3.8	4.09
2015	Obs	56	56	56	56	56
	Min	0	0	0	0	0
	Max	0.93	0.56	0.78	15	15
	Mean	**0.7**	**0.18**	**0.25**	**4.27**	**8.54**
	p50	0.8	0.18	0.26	4	9
	Skewness	-1.41	0.38	0.35	0.92	-0.5
	Kurtosis	3.9	2.7	1.97	4.06	4.19
2016	Obs	56	56	56	56	56
	Min	0.13	0	0	0	5
	Max	1	0.56	0.89	16	14
	Mean	**0.77**	**0.16**	**0.33**	**5.63**	**8.66**
	p50	0.82	0.16	0.41	5	8
	Skewness	-1.74	0.41	-0.11	0.82	0.51
	Kurtosis	6.07	3.04	2.28	3.71	2.69
2017	Obs	56	56	55	51	56
	Min	0.2	0	0	3	5
	Max	1	0.86	0.89	16	14
	Mean	**0.79**	**0.17**	**0.33**	**6.57**	**8.66**
	p50	0.82	0.18	0.4	5	8
	Skewness	-1.63	1.55	-0.14	1.38	0.51
	Kurtosis	6.6	8.13	2.6	4.23	2.69
ANOVA	F	3.03	0.66	1.6	5.24	0.21
	Prob>F	0.02	0.62	0.18	0	0.93

Source: Research data (2019)

4.2.1.2 Ownership structures

Ownership structure in the study was measured in terms of ownership concentration and institutional ownership. Table 4.2 presents findings on the ownership structure. From the findings, the ownership concentration was at 50% in 2013 while institutional ownership was at 46%. In 2014, ownership concentration declined to 43% as well as institutional ownership which declined to 43%. However, in 2015, ownership concentration increased to 55% while institutional ownership increased to 46%.There was a further increase in ownership concentration to 56% in 2016 though institutional ownership declined to 39%. Finally, in 2017, ownership concentration increased to 57% while institutional ownership declined to 33%. Evidently, there has been an increase in ownership concentration over the years while institutional ownership has been on the decline. Despite this, the change in ownership concentration ($F= 1.77$, $\rho=.13>.05$) and institutional ownership ($F= 1.57$, $\rho=.18>.05$) between 2013 to 2017 was not statistically significant.

Table 4.2

Ownership Structures

Year	Stat	Ownership Concentration	Institutional Ownership
2013	Obs	56.00	56.00
	Min	0	0
	Max	.95	.94
	Mean	**.50**	**.46**
	p50	.65	.56
	Skewness	-.38	-.47
	Kurtosis	1.62	1.78
2014	Obs	56.00	56.00
	Min	0	0
	Max	1	.94
	Mean	**.43**	**.43**
	p50	.24	.55
	Skewness	.26	-.29
	Kurtosis	1.56	1.60
2015	Obs	56.00	56.00
	Min	0	0
	Max	1	.94
	Mean	**.55**	**.46**
	p50	.71	.55
	Skewness	-.53	-.39
	Kurtosis	1.80	1.74
2016	Obs	56.00	56.00
	Min	.00	.00
	Max	1.00	.94
	Mean	**.56**	**.39**
	p50	.68	.48
	Skewness	-.77	-.02
	Kurtosis	2.35	1.38
2017	Obs	56.00	56.00
	Min	0	0
	Max	1	.92
	Mean	**.57**	**.33**
	p50	.68	.22
	Skewness	-.92	.31
	Kurtosis	2.57	1.39
ANOVA	F	1.77	1.57
	Prob>F	.13	.18

Source: Research data (2019)

4.2.1.3 Internal Controls

The study sought to establish the role of internal controls in addressing environmental reporting process. Table 4.3 illustrates the summary statistics for internal control during the 2013 to 2017 study period. The focus was on audit committee independence and audit committee meetings. From the findings, audit committee independence in 2013 was at 45%. In 2014, there was a slight increase in audit committee independence to 48% but it later declined to 46% in 2015. However, in 2016, audit committee independence increased to 53% and exhibited no change in 2017. The change in audit committee independence over the years was not statistically significant ($F= 1.28$, $\rho=.28>.05$). With reference to the audit committee meetings, the audit committee had 3 members in 2013, 2014 and 2015.However, the number of audit committee members increased to 4 in 2016 and 2017. There was a statistically significant difference in audit committee meetings between 2013 to 2017 for the firms listed in NSE ($F= 4.11$, $\rho=.00<.05$).

Table 4.3

Internal Controls

Year	Stat	Audit Committee Independence	Audit Committee Meetings
2013	Obs	56	56
	Min	0	0
	Max	1	11
	Mean	**.45**	**3.13**
	p50	.44	3.50
	Skewness	.02	.80
	Kurtosis	2.32	3.98
2014	Obs	56	56
	Min	0	0
	Max	1	11
	Mean	**.48**	**3.18**
	p50	.50	4.00
	Skewness	-.10	.42
	Kurtosis	2.42	3.63
2015	Obs	56	56
	Min	0	0
	Max	1.33	10
	Mean	**.46**	**3.07**
	p50	.44	3.00
	Skewness	.29	.31
	Kurtosis	3.34	3.33
2016	Obs	56	56
	Min	0	0
	Max	1.33	10
	Mean	**.53**	**3.91**
	p50	.50	4.00
	Skewness	.53	.03
	Kurtosis	4.25	4.00
2017	Obs	56	49
	Min	0	2
	Max	1.33	10
	Mean	**.53**	**4.47**
	p50	.50	4.00
	Skewness	.53	1.46
	Kurtosis	4.25	5.96
ANOVA	F	1.28	4.11
	Prob>F	.28	.00

Source: Research data (2019)

4.2.1.4 Environmental Disclosure

Darwish (2009) defined environmental disclosure as a set of information items related to the performance and activities of the environmental management of the company and its past, present, and future financial implications. There has been an increase in the number of firms disclosing environmental information in their annual financial reports to achieve the desires of investors and other stakeholders. It is against this backdrop that the study deemed it important to establish the environmental disclosure of firms listed in NSE. Basing on the findings in Table 4.4, between 2013 to 2015 environmental disclosure was at 43%. In 2016 there was an increase in disclosure to 47%. As of 2017, environmental disclosure of firms listed in NSE was at 48%.

Table 4.4

Environmental Disclosure

Year	**Obs**	**Min**	**Max**	**Mean**	**Sd**	**p50**	**skewness**	**Kurtosis**
2013	56	0.11	0.7	0.43	0.15	0.46	-0.76	2.57
2014	56	0.1	0.71	0.43	0.15	0.44	-0.64	2.49
2015	56	0.1	0.64	0.43	0.14	0.45	-0.88	2.92
2016	56	0.11	0.73	0.47	0.12	0.52	-1.03	4.38
2017	56	0.22	0.64	0.48	0.1	0.51	-0.79	2.9
F	*1.95*							
Prob>F	*0.1032*							

Source: Research data (2019)

4.2.1.4 Descriptive Statistics for Exogenous Endogenous and Control Variables

Findings from Table 4.5 showed that the environmental disclosure was at 47% among listed firms in NSE (Mean=.45, SD=.23). Results also showed that on average there are 9 boards of directors in listed firms (M=8.55, SD=2.67) with an

average of 73% board members being non-executive directors (M=.73, SD=.24). Findings indicated that 18% of boards of directors in listed firms were female (M=.18, SD=.15) with most of the companies not having a woman member on their boards. There was 29% of qualified board of directors. More findings revealed that board members meet on average of 5 times annually (M=4.99, SD=3.43). Regarding ownership structure, results showed that ownership of listed firms in NSE was highly concentrated with an average of 52 % (M=.52, SD=.32) with an institutional ownership of 41%. On audit committee, findings showed that there were 4 audit committee members in listed firms with 49% of them being non-executive audit committee members.

Table 4.5

Descriptive Statistics for Exogenous Endogenous and Control Variables

Obs	N	Min	Max	Mean	p50	Sd	skewness	Kurtosis
esd	280	0.1	0.73	0.45	0.47	0.13	-0.92	3.23
bs	280	0	15	8.55	8	2.67	-0.28	3.98
bi	280	0	1	0.73	0.8	0.24	-1.6	4.73
bd	280	0	0.86	0.18	0.18	0.15	0.87	4.1
bq	279	0	1	0.29	0.3	0.23	0.26	2.3
bm	275	0	16	4.99	4	3.43	0.91	4.25
oc	280	0	1	0.52	0.66	0.32	-0.45	1.76
io	280	0	0.94	0.41	0.515	0.33	-0.17	1.47
aci	280	0	1.33	0.49	0.5	0.27	0.13	3.21
acm	273	0	11	3.53	4	2.24	0.31	3.81
fs	280	0	8.81	6.49	6.83	1.47	-1.73	8.07

esd = Environmental sustainability disclosure, bi = board independence, bd = board diversity, bq = board qualifications, bm = board meetings, oc = ownership concentration, io = institutional ownership, aci = audit committee independence, acm = audit committee meetings, fs = financial strength, bs = board size

Source: Research data (2019)

4.2.2 Correlation Results

Correlation statistics is a method of assessing the relationship between variables/factors. The results regarding the correlation results were summarized and presented in Table 4.13. Pearson correlation results in Table4.6 showed that board independence is positively related to environmental disclosure with a Pearson Correlation coefficient of r= .600 which is significant at p <.01. The output also shows that board diversity is negatively related to environmental sustainability disclosure, with a coefficient of r = -.271 which is also significant at p<.01. This, therefore, means that the more board is diverse, the less environmental sustainability information is disclosed. Also, the correlation results indicated that board qualification is positively related toenvironmental sustainability disclosure as shown by a coefficient of r = .322 which is significant at p<.01.

Further, the number of board meetingswere also positively related to environmental sustainability disclosure as evidenced by a coefficient of r = .377 which is also significant at p<.01. In addition, institutional ownership is positively related to environmental sustainability disclosure, with a coefficient of r = .218 which is significant at p<.01. Besides, audit committee independence is positively related toenvironmental sustainability disclosure, with a coefficient of r = .349 which is also significant at p<.01.

Moreover, audit committee meetingsare positively related to environmental sustainability disclosure, with a coefficient of r = .279 which is also significant at p<.01. Also, the correlation results indicated that firm size is positively related

toenvironmental sustainability disclosure as shown by a coefficient of r = .445 which is significant at p<.01. Besides, board size is positively related toenvironmental sustainability disclosure, with a coefficient of r = .263 which is also significant at p<.01. However, ownership concentration was not correlated with environmental sustainability disclosure, with a coefficient of r = 0.074.It can be clearly observed that there is no significant association among predictor variables. The maximum coefficient of correlation matrix is 0.592 via association between boardindependence and financial strength, followed by 0.574, between board meetings and audit committee meetings.These correlations do not represent a harmful multicollinearity problem since they are all less than 60%. Bryman and Cramer (2001), and Guajarati (1995) posit that correlation between independent variables of more than 80% can be considered to be a serious multicollinearity problem.

Table 4.6

Pearson Correlation between Environmental Sustainability Disclosure and Corporate Governance

	Esd	Bi	Bd	bq	bm	oc	aci	acm	fs	bs
esd	1									
bi	.600**	1								
bd	-.271**	-.240**	1							
bq	.322**	.300**	.119*	1						
bm	.377**	.410**	0.056	.402**	1					
oc	0.074	.216**	-0.078	.164**	.210**	1				
io	.218**	.153*	-0.085	0.025	.228**	0.031				
aci	.349**	.215**	-0.103	.122*	.171**	.462**	1			
acm	.279**	.493**	0.01	.383**	.574**	.291**	.272**	1		
fs	.445**	.592**	-0.042	.321**	.369**	.285**	.184**	.449**	1	
bs	.263**	.401**	.168**	.349**	.322**	0.087	-.141*	.385**	.457**	1

Note:** Correlation is significant at the .01 level (2-tailed).* Correlation is significant at the .05 level (2-tailed).

N=56; Dependent variable, *esd = Environmental sustainability disclosure, bi = board independence, bd = board diversity, bq = board qualifications, bm = board meetings, oc = ownership concentration, io = institutional ownership, aci = audit committee independence, acm = audit committee meetings,fs = financial strength, bs = board size*

Source: Research data (2019)

4.2.3 Fixed Effect Model

Fixed effect model considers the independence of each firm or cross-sectional units incorporates in the sample allowing the intercept varies for each company but still assumes that the slope of the coefficients is stable within the firms. Table 4.7 highlights the regression results for the fixed model. The findings indicated that 64% variation in environmental sustainability disclosure is explained by board independence, board diversity, board qualification, board meetings, ownership concentration, institutional ownership, audit committee independence, audit committee meetings and board size.

From the Table, board independence showed a positive and significant effect on environmental sustainability disclosure (β= .24, ρ<.05). Specifically, an increase in the number of non-executive directors by .24 units leads to an increase in environmental sustainability disclosure by the same unit. The t-value = 8.90 which implies that it is more than the standard error.In agreement with the results are Anazonwu, Egbunike, and Gunardi (2018) who found a positive and significant effect of non-executive directors on sustainability reporting (p-value 0.0031< 0.05).

Moreover, board diversity showed a negative and significant effect on environmental sustainability disclosure (β= -.01, ρ<.05). Consequently, an increase in board diversity by .01 units leads to a decline in environmental sustainability disclosure by the same unit. The t-value is more than the error associated with as evidenced by t-value = 2.61. Inconsistent with the results are Anazonwu, Egbunike, and Gunardi (2018) who found a positive and significant

effect of women directors on sustainability reporting (p-value 0.0025 < 0.05). Other studies that depicted positive and significant effect were Fernandez-Feijoo, Romero, and Ruiz-Blanco. (2014); Frias-Aceituno, Rodriguez-Ariza, and Garcia-Sanchez (2013).

Furthermore, board qualification showed a significant effect on environmental sustainability disclosure (β= .07, ρ<.05). As such, an increase in board qualification by .07 units leads to an increase in environmental sustainability disclosure by the same unit. The t-value = 2.49 which indicates that the standard error associated with it is more than it. However, the number of board meeting had no influence on the environmental sustainability disclosure (β= .00, ρ>.05). Also, ownership concentration had a negative and insignificant effect on environmental sustainability disclosure (β= -.02, ρ>.05). In the same way, the audit committee meetings had no influence on the environmental sustainability disclosure (β= .00, ρ>.05).

In addition, institutional ownership showed a positive and significant effect on environmental disclosure sustainability (β= .05, ρ<.05). Specifically, an increase in deposits by .05 units leads to an increase in environmental disclosure sustainability by the same unit. The t-value = 2.77 which implies that it is more than the standard error.

Moreover, audit committee independence showed a positive and significant effect on environmental sustainability disclosure (β= .12, ρ<.05). Specifically, an increase in audit committee independence by .12 units leads to an increase in

environmental sustainability disclosure by the same unit. The t-value = 4.85 which implies that it is more than the standard error.

Finally, board size showed a positive and significant effect on environmental sustainability disclosure (β= .01, ρ<.05). Specifically, an increase in board size by .01 units leads to an increase in environmental sustainability disclosure by the same unit. The t-value = 2.66 which implies that it is more than the standard error.

The t-values test the hypothesis that each coefficient is different from 0. To reject this, the t-value has tobe higher than 1.96 (for a 95% confidence). If this is the case then you can say that the variable hasa significant influence on your dependent variable (ESD). The higher the t-value, the higher the relevance of the variable (Torres-Reyna, 2007). From Table 4.7, the findings indicate that board independence, board qualifications, board meetings institutional ownership, and audit committee independence have a significant influence on environmental sustainability disclosures. Board independence has the highest relevance (t = 8.90), followed by audit committee independence (t = 4.85) in explaining the firm disclosure of environmental sustainability information. The interclass correlation (abbreviated as 'rho') is 65%, implying that 65% of the variance is as a result of differences across panels.

Table 4.7

Fixed Effect Model

			Number of obs	**=**	**272**	
Fixed-effects (within) regression			**Number of groups**	**=**	**56**	
Group variable: firmID			**Obs per group: min**	**=**	**4**	
R-sq: within = .6399			**Avg**	**=**	**4.9**	
between = .3940			**Max**	**=**	**5**	
overall = .4872			**F(9,207)**	**=**	**4.87**	
corr(u_i, Xb) = -.0775			**Prob > F**	**=**	**.000**	
Esd	**Coef.**	**Std. Err.**	**T**	**P>t**	**[95% Conf.**	**Interval]**
Bi	.24	.03	8.90	.00	.18	.29
Bd	-.10	.04	-2.61	.01	-.17	-.02
Bq	.07	.03	2.49	.01	.02	.13
Bm	.00	.00	1.45	.15	.00	.01
Oc	-.02	.02	-.85	.40	-.05	.02
Io	.05	.02	2.77	.01	.02	.09
Aci	.12	.03	4.85	.00	.07	.17
Acm	.00	.00	-.02	.98	-.01	.01
Bs	.01	.00	2.66	.01	.00	.01
_cons	.11	.03	3.74	.00	.05	.17
sigma_u	.08					
sigma_e	.06					
Rho	.65	(fraction of variance due to u_i)				

F test that all u_i=0: F(55, 207) = 7.67 Prob > F = .0000

esd = Environmental sustainability disclosure, bi = board independence, bd = board diversity, bq = board qualifications, bm = board meetings, oc = ownership concentration, io = institutional ownership, aci = audit committee independence, acm = audit committee meetings, bs = board size

Source: Research data (2019)

4.2.4 Random Effect Model

The random effect model estimates the coefficients based on the assumption that the individual or group effects are uncorrelated with other independent variables. The regression results for the random model are as illustrated in Table 4.8. The random model showed that board independence, board diversity, board qualification, board meetings, ownership concentration, institutional ownership, audit committee independence, audit committee meetings and board size

explained 64% variation of environmental sustainability disclosure. From the Table, board independence showed a positive and significant effect on environmental sustainability disclosure (β= .24, ρ<.05). With an increase in board independence by .24 units, there is an increase in environmental sustainability disclosure by the same unit.

As well, board diversity showed a positive and significant effect on environmental sustainability disclosure (β= -.12, ρ<.05). Therefore, an increase in board diversity by .12 units leads to a decline in environmental sustainability disclosure by the same unit. In addition,board qualification showed a positive and significant effect on environmental sustainability disclosure (β= .07, ρ<.05). An increase in board qualification by .07 units leads to an increase in environmental sustainability disclosure by the same unit.

Furthermore, the number of board meetings showed no significant effect on environmental sustainability disclosure (β= .00, ρ>.05). Similarly, audit committee meetings had no influence on environmental sustainability disclosure (β= .00, ρ>.05). Consequently, an increase in board meetings and the audit committee meetings will have no influence on environmental sustainability disclosure.

In addition, ownership concentration showed a negative and significant effect on environmental sustainability disclosure (β= -.03, ρ<.05). Specifically, an increase in ownership concentration by .03 units leads to a decline in environmental sustainability disclosure by the same unit. Moreover, institutional ownership had a

positive and significant influence on environmental sustainability disclosure ((β= .04, ρ<.05). It is therefore expected that an increase in institutional ownership by .04 units, leads to an increase in environmental sustainability disclosure by the same unit.

Similarly, audit committee independence showed a positive and significant effect on environmental sustainability disclosure (β= .13, ρ<.05). Specifically, an increase in audit committee independence by .13 units leads to an increase in environmental sustainability disclosure by the same unit. Finally, board size had a positive and significant influence on environmental sustainability disclosure ((β= .01, ρ<.05). Specifically, an increase in board size by .01 units leads to an increase in environmental disclosure sustainability by the same unit.

Table 4.8

Random effect Model

			Number of obs	**=**	**272**	
Random-effects GLS regression			**Number of groups**	**=**	**56**	
Group variable: firmID			**Obs per group: min**	**=**	**4**	
R-sq: within = .6355			**Avg**	**=**	**4.9**	
between = .4377			**Max**	**=**	**5**	
overall = .5132			**Wald chi2(9)**	**=**	**398.77**	
corr(u_i, X) = 0 (assumed)			**Prob > chi2**	**=**	**0**	
Esd	**Coef.**	**Std. Err.**	**Z**	**P>z**	**[95% Conf.**	**Interval]**
Bi	.24	.03	9.47	.00	.19	.29
Bd	-.12	.04	-3.32	.00	-.19	-.05
Bq	.07	.03	2.81	.01	.02	.13
Bm	.00	.00	1.90	.06	.00	.01
Oc	-.03	.02	-1.93	.05	-.07	.00
Io	.04	.02	2.50	.01	.01	.08
Aci	.13	.02	5.78	.00	.09	.18
Acm	.00	.00	-1.13	.26	-.01	.00
Bs	.01	.00	2.95	.00	.00	.01
_cons	.13	.03	4.70	.00	.08	.18
sigma_u	.07					
sigma_e	.06					
Rho	.57	(fraction of variance due to u_i)				

esd = Environmental sustainability disclosure, bi = board independence, bd = board diversity, bq = board qualifications, bm = board meetings, oc = ownership concentration, io = institutional ownership, aci = audit committee independence, acm = audit committee meetings, bs = board size

Source: Research data (2019)

4.2.5 Hausman Test

To determine between fixed or random-effects model, a Hausman test is usually run where the null hypothesis will be that the preferred model is random effects in comparison to the alternative the fixed effects (Green, 2008). It basically examinesif the unique errors (u_i) are correlated with the regressors, and the null hypothesis is that they are not correlated. Later, the Hausman Specification test, developed by Hausman (1978) is conducted to select either fixed or random effect

estimator. The null hypothesis of this test suggests estimating the panel data using random effect estimator, while the alternative suggests the fixed effect model is the appropriate estimator. Rejecting the null (p-value <.05) indicates the fixed effect model is to be used.

The use of panel data model allows using either the fixed-effect models or random effect models to estimates the dependence relationship among the variables while taking care the issue of omitted variables (Brüderl and Ludwig, 2015). The decision of whether to use fixed effect or random effect models was made based on the results of Hausman test as suggested in the econometrics literature and Table 4.9 shows summarized results for the choice of the model.

From the Hausman test Table 4.9 which shows summary of the results, the conclusion is that the null hypothesis of "difference in coefficients not systematic" to determinants of environmental sustainability disclosure is rejected. This is because the chi-square value of 23.67 was significant, p-value = .0049. Therefore, this implies that effect of hypothesis is tested using the fixed effects model. This means that the most appropriate model is fixed effects. Similar findings that applied fixed-effects model was Anazonwu, Egbunike, and Gunardi (2018) with a p-value of 0.044. In support of the fixed effects model application was Gangl (2010), while Brüderl and Ludwig (2015) posit that while standard regression models assume biased estimates of causal effects in case there are unobserved confounders, fixed effects regression is a method that can (if certain assumptions are valid) give unbiased estimates in such situation. Further, Torres-Reyna (2007) noted that the fixed-effects model controls for all time-

invariantdifferences between the individuals, so the estimatedcoefficients of the fixed-effects models cannot be biasedbecause of omitted time-invariant characteristics.

Table 4.9

Hausman test

	---- Coefficients ----			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
Esd	**Fe**	**Re**	**Difference**	**S.E.**
bi	.237	.242	-.005	.007
bd	-.098	-.117	.019	.013
bq	.072	.075	-.002	.012
bm	.003	.004	-.001	.001
oc	-.016	-.034	.018	.006
io	.053	.044	.009	.008
aci	.121	.134	-.013	.009
Acm	.000	-.003	.003	.001
bs	.008	.008	.000	.002

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg
Test: Ho: difference in coefficients not systematic
chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 23.67
Prob>chi2 = .0049

esd = Environmental sustainability disclosure, bi = board independence, bd = board diversity, bq = board qualifications, bm = board meetings, oc = ownership concentration, io = institutional ownership, aci = audit committee independence, acm = audit committee meetings, bs = board size

Source: Research data (2019)

4.2.6 Hypotheses Testing

Hypothesis 1(H_{o1a}) stated that board independence has no significant effect on environmental sustainability disclosure. Findings showed that board independence had coefficients of estimate which was significant basing on β_{1a} = .24 (p-value = .000 which is less than α = .05). The null hypothesis was thus rejected and it was

concluded that board independence has a positive and significant effect on environmental sustainability disclosure. This suggested that there was up to .24 unit increase in environmental sustainability disclosure for each unit increase in non-executive directors in the board. Consistent with the findings, Anazonwu, Egbunike, and Gunardi (2018); in Australia, Ong and Djajadikerta (2017). Lim *et al* (2007) indicated that independent boards of directors disclosed more discretionary "forward-looking quantitative and strategic" information. For Adeniyi and Fadipe (2018) study in Nigeria, the significant relationship lead to an assumption that non-whole time service directors aid by having great influence on sustainability disclosures in their firms.

Similarly, Post *et al.*(2011) indicated that a high number of outsider status board of directors is related to more favourable ESR disclosures. In addition, Jizi (2017) observed that higher board independence can enhance the corporate image of the firm by enhancing societal conscience. The most arguable reasons for the incorporation of non-executive directors on the firm board is that being non-whole time service directors, they have incentives to perform their monitoring activities and not to collude with top management (Onuorah, Egbunike and Gunardi, 2018). In buttress of the findings Liao *et al.* (2014), observed presence of a positive relationship between significant non-whole time service directors and comprehensive disclosure of Green House Gas (GHG) information in United Kingdom, applying univariate as well as regression models.

Jizi, Salama, Dixon and Stratling (2014) emphasized in their findings the role of whole-time service directors in spearheading not only the quantity but also the

quality, of reported CSR information. Indeed, whole-time service directors, in contrast to none whole time service directors, consider more the "perception and efficacy of firms' social profile". The agency theory in support of the findings, argues that as the proportion of non-whole time service directors on the board increases, the board effectiveness towards monitoring as well as controlling management is enhanced (Akbas, 2016; Jizi *et al*. 2014; Liao *et al.* 2014).

Furthermore, it is argued that as non-whole time service directors are less inclined towards management, they can be viewed as a balance mechanism in ensuring that firms act in the best interests of shareholders, other stakeholders as well as the general society (Sharif and Rashid, 2014). In effect, this encourages firms to disclose more information to outside stakeholders.

However, Hossain and Reaz (2007) elucidated that the presence of non-executive directors on the board had no influence on discretionary environmental disclosure level. Also, in Australia, Rao and Tilt (2016b) found that the association between executive/non-independent directors and sustainability disclosure is unclear. Further, Said *et al.* (2009) found no association between board independence and sustainability disclosure.

Hypothesis 1(H_{o1b}) stated that board diversity has no significant effect on environmental sustainability disclosure. However, the regression results indicated that board diversity had a negative and significant influence environmental sustainability disclosure (β= -.01, ρ<.05). The null hypothesis was therefore not accepted and it was concluded that an increase in board diversity by .01 units

leads to a decline in environmental sustainability disclosure by the same unit. Contrary to the findings was in Nigeria, Anazonwu, Egbunike, and Gunardi(2018); in Australia, Ong and Djajadikerta (2017), Nadeem, Zaman and Saleem (2017); in Spain, Cabeza-García, Fernández-Gago and Nieto (2017); in Canada, Ben-Amar *et al.* (2017); in the United Kingdom, Jizi (2017), Arayssi, Dah and Jizi (2016); in Pakistan, Thailand and Malaysia, Yasser, Al Mamun and Ahmed (2017); in France, Nekhili, Nagati, Chtioui and Nekhili (2017); as well as in the United States of America, Rupley, Brown and Marshall (2012) indicated that sustainability reporting has greater value relevance to the market value of entities with a gender-diverse board as compared to the firms with men dominated boards.

Jizi (2017) attributes this to women participation on boards favorably which in effect results to "CSR engagement and reporting and the establishment of ethical policies". Also Mahmood and Orazalin (2017) established that there is a positive relationship between gender diversity and environmental sustainability disclosure. Consequently, firms with women dominated boards tend to report more transparent ecological performance information as well as higher levels of environmental sustainability information. Gender-sensitive boards are related to more quality CSR reports (Al-Shaer and Zaman, 2016).

Further, the presence of females on firm's boards favorably impacts on its risk appetite as well as performance by supporting its investment in social engagements plus reporting on them (Arayssi *et al.,* 2016). Post *et al.*(2011) elucidated that entities with three or more female directors exhibited favourable

ESR disclosures. Huse and Solberg (2006) ascertained that women may giveinputs on corporate boards through creation of alliances, preparation as well as involvement, being actively engaged in vital decisions, taking leadership roles and beingvisible.An increased ration of women on the board leads to "better corporate communication"(Barako and Brown, 2008). In addition, it is argued that as women undertake differentroles from men in the society, female directors on theboard may have a different perspective to ecological matters (Liao *et al.*,2014).

On the flip side, Adeniyi and Fadipe (2018), Handajani, Subroto, Sutrisno and Saraswati (2014), and Akbas (2016) found that board gender diversity does not significantly affect environmental sustainability reporting.

Hypothesis 1(H_{o1c}) stipulated that board qualification has no significant effect on environmental sustainability disclosure. On the contrary, the regression findings indicated that board qualification was associated with an increase in environmental sustainability disclosure (β= .07, ρ<.05). As such, the null hypothesis was rejected. The implication is that an increase in board qualification by .07 units leads to an increase in environmental sustainability disclosure by the same unit. In line with the findings, Gul and Leung (2004) indicated that board of directors' composition and quality had an impact on managers' way of disclosing the voluntary information. Further, Akhtaruddin and Abdur Rouf (2011) observed a significant positive relationship between members of the board in possession of business as well as accounting andvoluntary disclosure.

Hypothesis 1(H_{o1d}) stipulated that board meetings had no significant effect on environmental sustainability disclosure. The findings indicated that indeed the number of board meetings had no influence on environmental sustainability disclosure. The null hypothesis was therefore accepted suggesting that board meetings were of no value to environmental sustainability disclosure. In consonance with the results is Osazuwa *et al.* (2016) and Cormier *et al.,* (2010) that there was not much board activity. Contrary to the findings was Odoemelam and Okafor (2018) partial regression coefficient of 2.676 that indicated the positive impact of board meeting on the degree of ecological reporting. The results buttressed that board meeting frequency enhances the quantity of ecological reporting as well as assist in overcoming agency conflicts (Ntim and Osei, 2011; Xie, Davidson and DaDalt, 2003).

Hypothesis 1(H_{o1e}) indicated that board size has no significant effect on environmental sustainability disclosure. However, the findings indicated that board size has a positive and significant influence on environmental sustainability disclosure (β= .01, ρ<.05). Specifically, an increase in board size by .01 units leads to an increase in environmental sustainability disclosure by the same unit. Consistent with the study findings, Mahmood and Orazalin (2017) in analysis of the relationships between corporate board characteristics and environmental sustainability disclosures (ESD) on all oil, gas and mining firms in Kazakhstan listed at Kazakhstan Stock Exchange indicated that Board size was significantly and positively related with the composite ESD index, an indication that effective board size results into better ESD. In addition, Mgbame and Onoyase (2015)

examination of corporate governance (bard size) on ecological reporting indicated a positive and significant relationship. Further, boards with few numbers of directors might suffer from high workloadand responsibilities that mayobstruct their oversight role (Beiner, Drobetz, Schmid and Zimmermann, 2004).The larger boardsize may resultin an increased number of directors havingmore of financial or accounting knowledge, which could positivelyimpact on corporate ecologicalreporting (Akbas, 2016; Elzahar and Hussainey2012).

However, contrary result was by Oba and Fodio (2012), Uwuigbe,Egbideand Ayokunle (2011) who found an inverse association between board size and firm's ecological reporting. As well, Adeniyi and Fadipe (2018) results did not find significant effect of the board size on sustainability disclosures, attributing this to little influence the numbers of board members can have on a firm exercising sustainability disclosure.It is suggested that boards with small numbers of directors are advantaged with regard to low degrees of communication failureas well asproper coordination, leading to better monitoring and management control (Ahmed,Hossain and Adams 2006; Dey, 2008).

In a similar vein, Jensen (1993) buttressed that larger boards are not likely to be effective as well as easier to be managed and manipulated by the chief executive officer than smaller boards. In addition, it is argued that as the number of the directors on the board is enhanced, the oversight capacity of the board as well increases, even though the benefit may be outweighed by the growing cost of ineffective communication as well as slower decision-making process (Hidalgo, García-Meca and Martínez, 2011). Because of the need for effective

communication as well as coordination among members of the board, in regard to content and degree of ecological information reporting decision, a negative relationship between board size and the degree of ecological reporting can be expected (Bouaziz, 2014). Besides these results, some studies found a non-significant association between board size and the degree of voluntary disclosure (such as, Akbas, 2016; Arcay and Vazquez 2015; Sartawi *et al.* 2014; Fathi, 2013; Saha and Akter 2013; Ienciu *et al.*, 2012).

Hypothesis 2(H_{o2a}) stated that institutional ownership has no significant effect on environmental sustainability disclosure. Findings showed that institutional ownership had coefficients of the estimate which was significant basing on $\beta = .05$ ($\rho < .01$) which is less than $\alpha = .000$ hence it was concluded that institutional ownership had a positive and significant effect on environmental sustainability disclosure. Consequently, an increase in institutional ownership by .05 units leads to an increase in environmental sustainability disclosure by the same unit. In conformity with the results, Ghazali (2007) noted that firms with major state ownership held shares, as well as direct ownership, reported more CSR information in their end year reports thus having a significant influence on CSR disclosure. However, Al-Hssaini, Al-Kwari, and Nuseibeh (2006) found that the number of institutional investors, individual investors and government ownership, the results showed their little effect on the extent of CSD.

Hypothesis 2 (H_{o2b}) stated that ownership concentration has no significant effect on environmental sustainability disclosure. However, the regression results indicated that ownership concentration had a negative and insignificant influence

environmental sustainability disclosure (β= -.02, ρ<.05). The null hypothesis was therefore accepted and it was concluded that an increase in ownership concentration by .02 units leads to a decline in environmental sustainability disclosure by the same unit. Juhmani (2013) indicated a significant negative relationship between blockholder ownership and voluntary information reporting. Contrary to the results, Brammer and Pavelin (2008) and Cormier *et al*. (2005) provided evidence of significant negative relationship between ownership concentration and environmental disclosure quality in annual reports.

Also, Grüning and Bergerernst (2010) established that ownership concentration has a positive impact on environmental sustainability disclosure. In the same way, Chau and Gray (2002) found out that the level of ownership outside the entity was positively related to voluntary reporting – incorporating ecological reporting. However, Esa and Zahari (2016) indicated that ownership structure and board characteristics have no significant influence on CSR reporting. Similarly, Marshall *et al.* (2011) study lacked evidence with regard to an association between long-dimension institutional ownership as well as any of the discretionary ecological reporting quality measures. Also, Mgbame and Onoyase (2015) examination of corporate governance (ownership concentration) on ecological reporting indicated a positive and significant association.

Hypothesis 3(H_{o3a}) stated thataudit committee meetings had no significant effect on ecological sustainability. Findings showed that audit committee meetingshad coefficients of estimate which was insignificant basing on β=.00 (p-value = .98 which is more than α = .000 hence audit committee meetings had no significant

effect on environmental sustainability disclosure. Other than the audit committee meetings, Ntim, Soobaroyen and Broad (2017) audit committee quality was associated with the level of environmental sustainability disclosure. As well, Barako *et al.* (2006) established that the presence of an audit committee, level of institution and foreign ownership, had positive significant relationship with the extent of environmental reporting. Further, Akhtaruddin and Haron (2010) study in Malaysia found that the ration of audit committee members to the total members on the firm board not associated with the voluntary sustainability reporting.

Hypothesis 3(H_{o3b}) stated that audit committee independence has no significant effect on environmental sustainability disclosure. Findings showed that audit committee independencehad coefficients of estimate which was significant basing on $\beta = .12$ (p-value = .00 which is less than $\alpha = .05$ hence it was concluded that audit committee independence had a positive and significant effect on environmental sustainability disclosure. This suggested that there was up to .12 unit increase in environmental sustainability disclosure for each unit increase in audit committee independence. In agreement to the findings, Mgbame and Onoyase (2015) examination of corporate governance (audit committee independence) on ecological reporting indicated a positive and significant association. Further, institutional investors have strong incentives to oversight corporate reporting practices as well as influence corporate values because of their large ownership stake (Barako *et al.*, 2006). In addition, they might take into

account ecological matters to be paramount as a means of longterm value creation (Prado-Lorenzo *et al*., 2009; Welford, 2007).

From an agency theory perspective, the audit committee represents one of the functional methods that can be appliedtowards attenuating agency costs (Forker 1992), as it acts as a monitoring mechanism which aims to enhance the quality of information provided to stakeholders as well as the auditing process (Collier, 1993). Contrally to the findings was Aburaya (2012) of an insignificant association towards overall ecological reporting quality that was due to deficiency of ecological audit carried out by firms and, consequently, the duty of autonomous non-executive directors on the audit committee may not be evident. Further, the study attributed the study findings to possible existence of "grey directors" whose real autonomy may be put into question.

4.2.7 Moderation Effect of Financial Strength on the relationship between Corporate Governance and Environmental Sustainability Disclosures

The fourth objective of the study was to establish the moderating effect of financial strength on the relationship between corporate governance and environmental sustainability disclosure of firms listed in NSE.A moderator is a variable that specifies conditions under which a given predictor is related to an outcome. The moderator explains 'when' a DV and IV are related. Moderation implied an interaction effect, where introducing a moderating variable changes the direction or magnitude of the relationship between two variables. A moderation effect could be (a) Enhancing, where increasing the moderator would

increase the effect of the predictor (IV) on the outcome (DV); (b) Buffering, where increasing the moderator would decrease the effect of the predictor on the outcome; or (c) Antagonising, where increasing the moderator would reverse the effect of the predictor on the outcome (Plumlee*et al.*, 2015). Corollary hypotheses were therefore developed.

4.2.7.1 Moderation Effect of Financial Strength on the Relationship between Board Characteristics and Environmental Sustainability Disclosure

Table 4.10 presents results on the moderating effect of financial strength on the relationship between board characteristics and environmental sustainability disclosure. It can be seen from the Table that there is a positive and significant moderating effect of financial strength on the relationship between board independence and environmental sustainability disclosure ($\beta = .23$, $\rho<.05$). With financial strength, the effect of board independence on environmental disclosure is increased.

The beta value ($\beta= -.03$,$\rho<.05$) in Table 4.10 shows that financial strength has a negative and significant moderating effect on the relationship between board diversity and environmental sustainability disclosure. Thus it implies that financial strength weakens the relationship between board diversity and environmental sustainability disclosure.

In addition,there is a positive and insignificant moderating effect of financial strength on the relationship between board qualification and environmental sustainability disclosure ($\beta = .13$, $\rho>.05$). As such, financial strength has no

impact on the relationship between board qualification and environmental sustainability disclosure. Finally, it can be seen from Table 4.10 that there is a negative and significant moderating effect of financial strength on the relationship between board meetings and environmental sustainability disclosure (β = -.16, ρ<.05), implying that the presence of financial strength weakens the relationship between board meetings and environmental sustainability disclosure.

For the model 2, R^2 = 0. 42. This R^2 means that 42% of the variance in environmental sustainability disclosure is explained by board charcteristics and financial strength. Model 7 indicates the results after the interactionterm (board charcteristics*financial strength) was included in the equation. The inclusion of the interactionterm resulted in an R^2 change of 0.03. The results show a significant presence of moderating effect. The moderating effect of financial strength explains 3% variance in environmental sustainability disclosure above and beyond the variance by board charcteristics and financial strength. Thus, the null hypothesis was rejected and therefore financial strengthenhances the relationship between environmental sustainability disclosureandboard charcteristics.

Table 4.10

Moderation effect of Financial Strength on the relationship between Board Characteristics and Environmental Sustainability Disclosure

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**
Zesd	**Coef.(Std.err.**	**Coef.(Std.err.**	**Coef.(Std.err.**	**Coef.(Std.err.**	**Coef.(Std.err.**	**Coef.(Std.err.**	**Coef.(Std.err.**
_cons	.28(.04)**	.17(.03)**	.01(.00)*	.44(.00)**	.38(.10)**	(-.00)(.05)	(-.01(.05)
Zbs (control)	.02(.00)**	.01(.00)*	.15(.03)**	.00(.00)	.00(.00)	(-.03)(.06)	(-.03(.06)
Zbi		.28(.03)**	.01(.00)	(-.23)(.11)*	(-.22)(.13)	.41(.06)**	.42(.06)**
Zbd		(-.17)(.04)**	.24(.03)**	(-.13)(.04)**	.09(.14)	(-.20)(.05)**	(-.18(.05)**
Zbq		.07(.03)*	(-.17)(.04)**	.08(.03)*	.07(.03)*	.14(.05)*	.14(.05)*
Zbm		.01(.00)*	.07(.03)*	.01(.00)	.00(.06)	.14(.05)*	.14(.05)*
Zfs			.01(.00)*	-.03)(.01)*	(-.03)(.01)**	.09(.06)	.07(.06)
zbi_fs				.23(.05)**	.25(.06)**	.03(.05)	.09(.05)
zbd_fs					(-.03)(.03)*	(-.04)(.05)	(-.02(.05)
zbq_fs						.13(.05)	.15(.05)*
zbm_fs							(-.16)(.06)*
R-sq:							
Within	*.09*	*.57*	*.58*	*.43*	*.43*	*.44*	*.44*
Between	*.07*	*.33*	*.34*	*.45*	*.44*	*.48*	*.56*
Overall	*.07*	*.42*	*.43*	*.44*	*.44*	*.45*	*.47*
R-sq Δ	*.07*	*.35*	*.01*	*.01*	*.00*	*.01*	*.02*
Waldchi2(9)	*12.82*	*155.91*	*148.05*	*196.19*	*202.23*	*213.34*	*226.65*
Prob> chi2	*.00*	*.00*	*.00*	*.00*	*.00*	*.00*	*.00*
Sigma_u	*.10*	*.09*	*.08*	*.08*	*.20*	*.20*	*.14*
sigma_e	*.09*	*.06*	*.06*	*.06*	*.72*	*.72*	*.73*
Rho	*.54*	*.64*	*.64*	*.65*	*.07*	*.07*	*.04*

*bs = board size, bi = board independence, bd = board diversity, bq = board qualifications, bm = board meetings, fs = financial strength***p<.01, *p<.05

Source: Research data (2019)

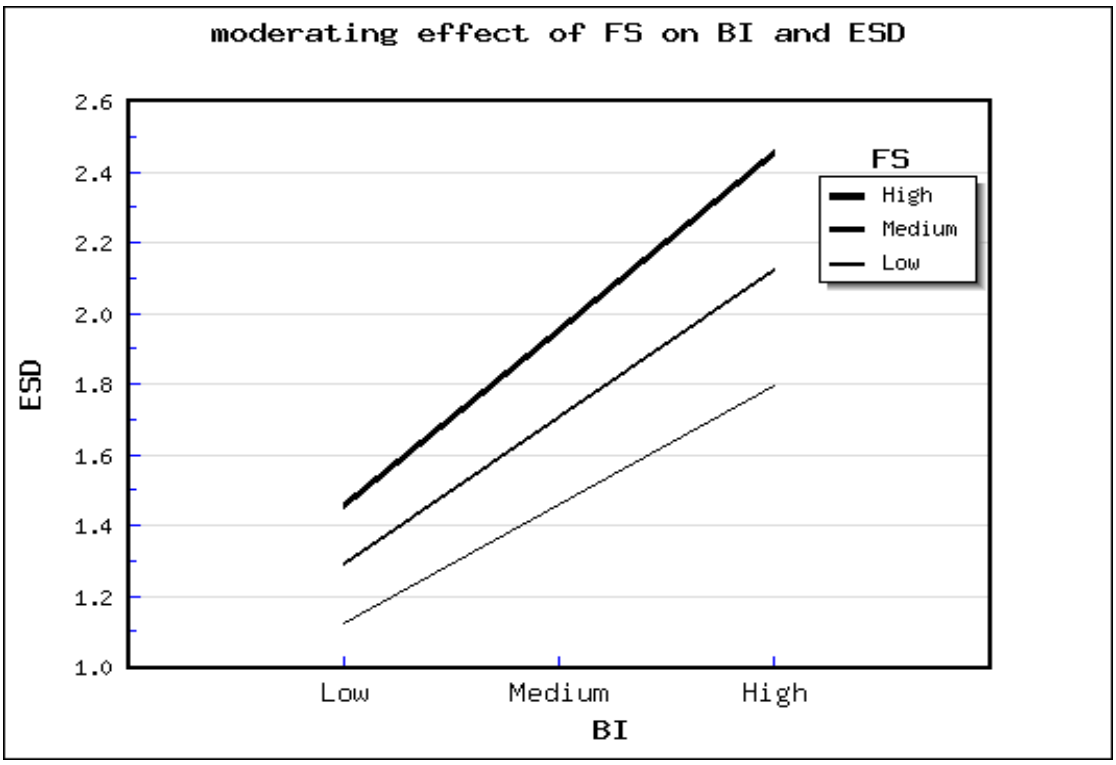

Figure 4.1Modgraph for Moderating Effect of Financial Strength on Board Independence and Environmental Sustainability Disclosure

Source: Research data (2019)

To show enhancing, buffering and diminishing moderating effect, the study used modgraph as recommended by Barone, Ranamagar and Solomon (2013). Fig. 4.1 indicate enhancing moderating effect, thus at high levels of financial strength, environmental sustainable disclosure increases with increase of board independence than in medium and low levels of board independence. Further, the figure demonstrates a stronger relationship between environmental sustainable disclosure and financial strength as result of steep slope. This shows that firms with high financial strength are likely to experience increases in environmental sustainability disclosures as a result of increase in board independence (number of non-executive members). Also, it may be associated with the fact that big firms in terms of asset base have more and diverse

institutional resources to implement corporate governance systems necessary for enhanced environmental disclosure as compared to small firms that may not have variety in its institutional resources.

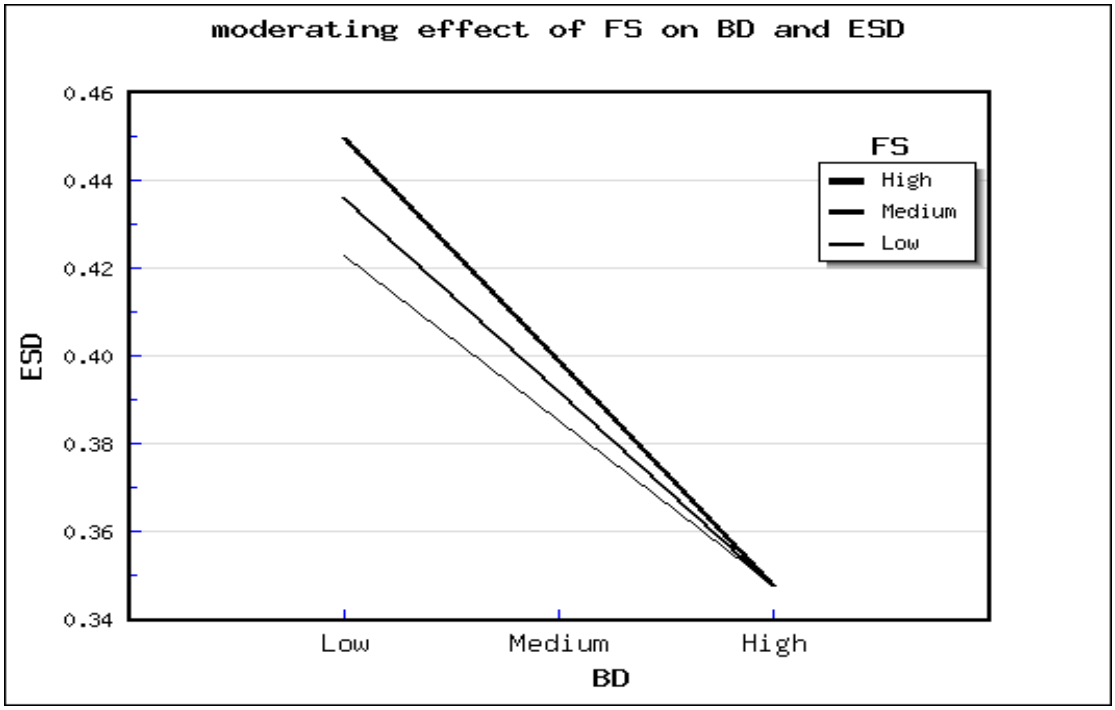

Figure 4.2 Modgraph for Moderating Effect of Financial Strength on Board Diversity and Environmental Sustainability Disclosure

Source: Research data (2019)

Figure 4.2 reveals a decreasing moderating effect, thus at high levels of financial strength, environmental sustainability disclosure decreases with increase in board diversity, even though, not as much compared to in medium and low levels of financial strength. Further, the figure demonstrates a stronger relationship between environmental sustainable disclosure and financial strength. This is evidenced by the slope regressing environmental sustainability disclosureon board diversitywhich is steeper for the large companies as compared to small companies.Therefore, it shows that firms

with high financial strength are likely to experience decrease in environmental sustainability disclosure as results of increase in board diversity.

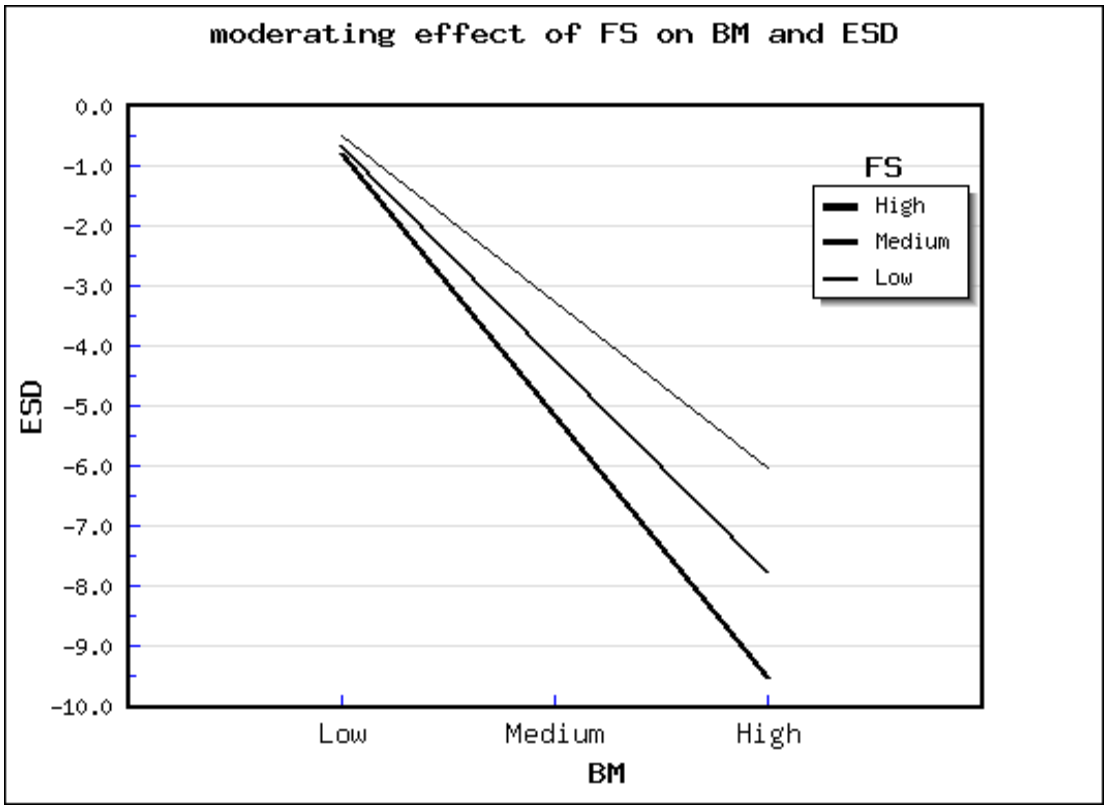

Figure 4.3 Modgraph for Moderating Effect of Financial Strength on Board Meetings and Environmental Sustainability Disclosure

Source: Research data (2019)

Fig. 4.3 reveals a decreasing moderating effect, thus at high levels of financial strength, environmental sustainability disclosure decreases with increase of board meetings than in medium and low levels of financial strength. Further, the figure demonstrates a stronger relationship between environmental sustainability disclosure and financial strength.This is evidenced by the slope regressing environmental sustainability disclosureon board meetingswhich is steeper for the large companies as compared to small companies.The results hows that firms with high financial strength are likely to experience decrease

in environmental sustainability disclosure as results of decrease in the number of meetings a board holds in a year.

4.2.7.2 Moderation effect of Financial Strength on the relationship between Ownership Structure and Environmental Sustainability Disclosure

Table 4.11 presents results on the moderating effect of financial strength on the relationship between ownership concentration and environmental sustainability disclosure. Financial strength has a negative and significant moderation effect on the association between ownership concentration and environmental disclosure (β = -.01, ρ<.05). This implies that financial strength weakens the relationship between ownership concentration and environmental disclosure. Furthermore, the regression results showed a positive and significant moderating effect of financial strength on the relationship between institutional ownership and environmental disclosure (β = .14, ρ<.05), meaning that financial strength enhances the association between ownership concentration and environmental sustainability disclosure.

For the model 2, R^2 = 0.13. This R^2 means that 13% of the variance in environmental sustainability disclosure is explained by ownership structure andfinancial strength. Model 5 indicates the results after the interactionterm (ownership structure *financial strength) was included in the equation. The inclusion of the interactionterm resulted in an R^2 change of 0.13. The results show a significant presence of moderating effect. The moderating effect of financial strength explains 13% variance in environmental sustainability disclosure above and beyond the variance by ownership structure and financial strength. Thus, the null hypothesis was rejected and therefore financial

strengthstrengthens the relationship between environmental sustainability disclosureandownership structure.

Table 4.11

Moderation effect of Financial Strength on the relationship between Ownership Structure and Environmental Sustainability Disclosure

Zesd	**model 1 Coef.(Std. Err.)**	**model 2 Coef.(Std. Err.)**	**model 3 Coef.(Std. Err.)**	**model 4 Coef.(Std. Err.)**	**model 5 Coef.(Std. Err.)**
_cons	(-.00)(.06)	(-.00(.06)**	(-.00)(.05)	(-.00(.05)	.00(.05)
Zbs	.26(.06)**	.28(.06)**	.10(.05)	.10(.06)	.09(.06)
Zoc		.04(.06)	(-.05)(.31)	(-.05(.05)	(-.05(.05)
Zio		.24(.06)**	.21(.05)**	.21(.05)**	.22(.05)**
Zfs			.40(.06)**	.40(.06)**	.39(.06)**
zoc_fs				(-.01(.05)*	(-.02(.05)
zio_fs					.14(.05)*
R-sq:					
Within	.01	.07	.19	.19	.22
Between	.45	.38	.43	.43	.39
Overall	.07	.13	.25	.25	.26
R-sq Δ	.07	.06	.12	.00	.01
Waldchi2(9)	2.74	41.61	89.41	88.86	96.73
Prob> chi2	.00	.00	.00	.00	.00
sigma_u	.00	.00	.06	.08	.12
sigma_e	.94	.91	.85	.85	.83
Rho	.00	.00	.01	.01	.02

bs = board size, oc = ownership concentration, io = institutional ownershipfs = financial strength

**p<.01, *p<.05

Source: Research data (2019)

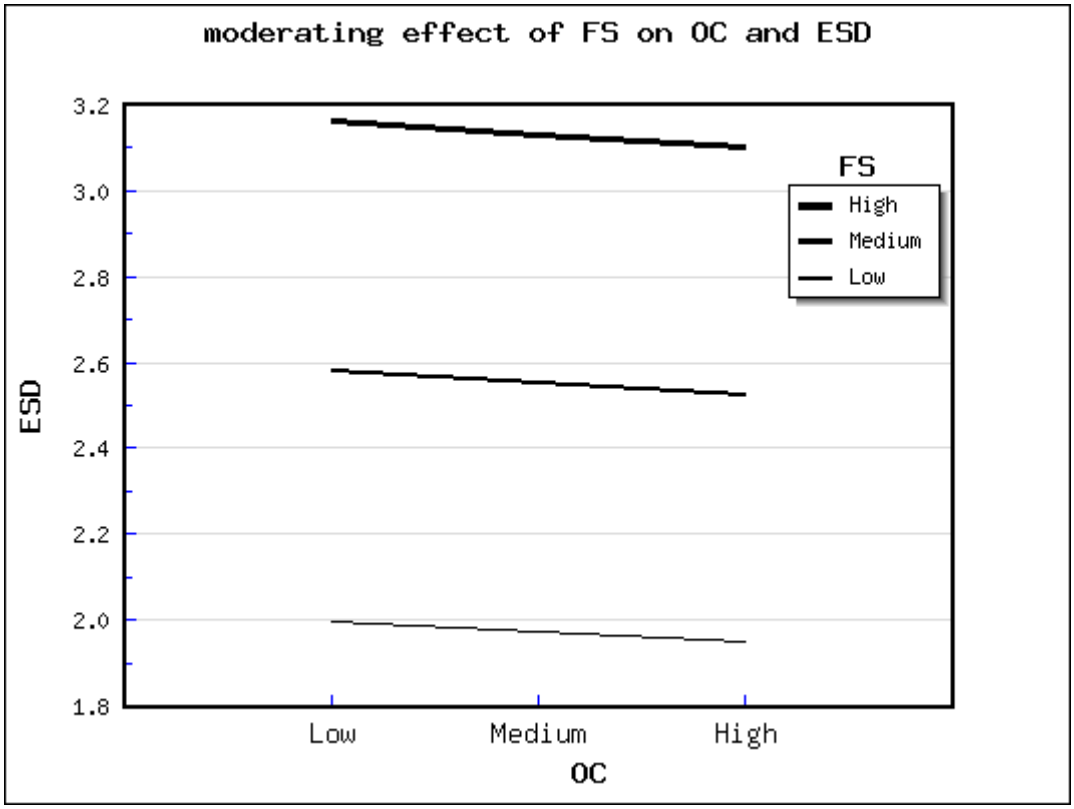

Figure 4.4 Modgraph for Moderating Effect of Financial Strength on Institutional Ownership and Environmental Sustainability Disclosure

Source: Research data (2019)

Fig. 4.4 reveals a buffering moderating effect, implying that at high levels of financial strength, environmental sustainability disclosure decreases with an increase of ownership concentration than in medium and low levels of financial strength. Further, the figure demonstrates a weak relationship between environmental sustainability disclosure and financial strength as result of slightly steep slope. This indicates that firms with high financial strength are likely to experience decrease in environmental sustainability disclosure as results of increase in the number of blockholdersin excess of 3 percent.

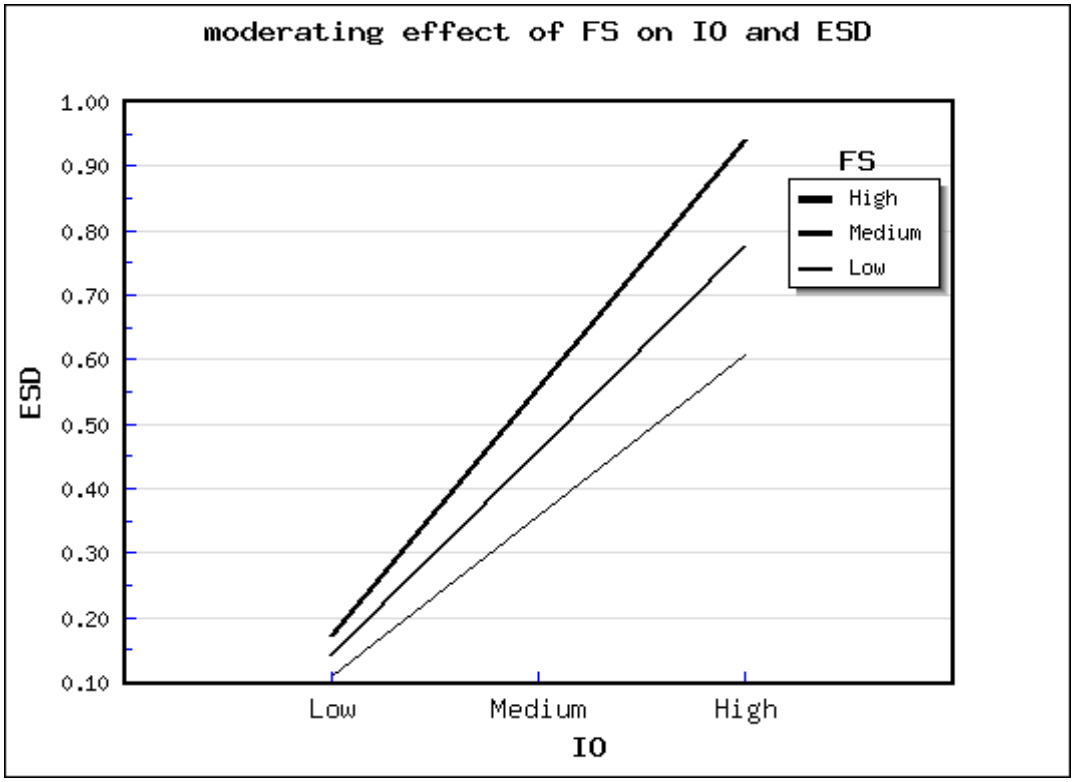

Figure 4.5 Modgraph for Moderating Effect of Financial Strength on Institutional Ownership and Environmental Sustainability Disclosure

Source: Research data (2019)

An enhancing moderating effectis indicated in Fig. 4.5implying that at high levels of financial strength, environmental sustainable disclosure increases with an increase of institutional ownership than in medium and low levels of board independence. Further, the figure demonstrates a stronger relationship between environmental sustainable disclosure and financial strength as result of steep slope. This indicates that firms with high financial strength are likely to experience increases in environmental sustainable disclosure as a result of different institutional ownership (especially with government stake).

4.2.7.3 Moderation effect of Financial Strength on the relationship between Internal Controls and Environmental Sustainability Disclosure

Table 4.12 illustrates the results of the moderation effect of financial strength on the relationship between internal controls and environmental disclosure. From the findings, financial strength has a negative butinsignificant moderating effect on the relationship between the audit committee meetings and environmental disclosure (β= -.06).However, there is a positive and significant moderating effect of financial strength on the relationship between audit committee independence and environmental sustainability disclosure (β = .13, ρ<.01).

For the model 2, R^2 = 0.23. This R^2 means that 23% of the variance in environmental sustainability disclosure is explained by internal controls andfinancial strength. Model 5 indicates the results after the interactionterm (internal controls *financial strength) was included in the equation. The inclusion of the interactionterm resulted in an R^2 change of 0.09. The results indicate a significant presence of moderating effect. The moderating effect of financial strength explains 9% variance in environmental sustainability disclosure above and beyond the variance by internal controls and financial strength. Thus, the null hypothesis was rejected and therefore financial strengthmoderates the association between environmental sustainability disclosureandinternal controls.

Table 4.12

Moderation effect of Financial Strength on the relationship between Internal Controls and Environmental Sustainability Disclosure

Zesd	**Model 1 Coef.(Std. Err.)**	**Model 2 Coef.(Std. Err.)**	**Model 3 Coef.(Std. Err.)**	**Model 4 Coef.(Std. Err.)**	**Model 5 Coef.(Std. Err.)**
_cons	((-.00)(.06)	(-.01(.05)	(-.01(.05)	(-.00(.05)	(-.00)(.05)
Zbs	.26(.06)**	.30(.06)**	.18(.06)**	.19(.06)**	.17(.06)*
Zacm		.06(.06)	(-.02(.06)	(-.02(.07)	(-.01(.07)
Zaci		.38(.06)**	.33(.06)**	.32(.06)**	.31(.06)**
Zfs			.31(.00)**	.32(.06)**	.32(.06)**
zacm_fs				(-.06(.05)	(-.10(.05)
zaci_fs					.13(.06)**
R-sq:					
Within	.01	.14	.22	.20	.23
Between	.45	.58	.54	.59	.56
Overall	.07	.23	.30	.30	.32
R-sq Δ	.07	.16	.07	.00	.02
Waldchi2(9)	2.74	81.38	113.20	113.77	121.17
Prob> chi2	.00	.00	.00	.00	.00
sigma_u	.00	.00	.00	.00	.00
sigma_e	.94	.88	.84	.85	.84
Rho	.00	.00	.00	.00	.00

bs = board size, acm = audit committee meetings, aci = audit committee independence, fs = financial strength

**p<.01, *p<.05

Source: Research data (2019)

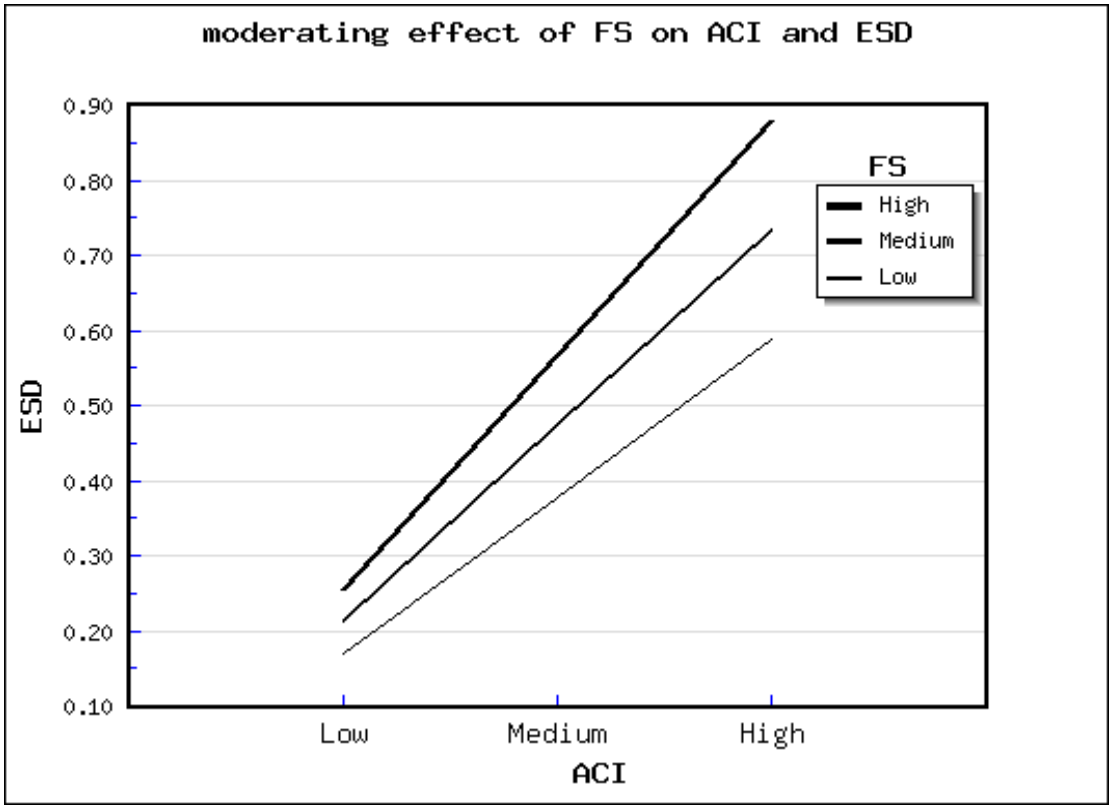

Figure 4.6Modgraph for Moderating Effect of Financial Strength on Audit Committee Independence and Environmental Sustainability Disclosure

Source: Research data (2019)

An enhancing moderating effectis indicated in Fig. 4.6implying that at high levels of financial strength, environmental sustainable disclosure increases with an increase in audit committee independence than in medium and low levels of board independence. More so, the figure demonstrates a stronger relationship between environmental sustainable disclosure and financial strength as result of steep slope, an indication that firms with high financial strength are likely to experience increases in environmental sustainable disclosure as a result of a more independent audit committee (majority being non-executive directors).

4.3 Discussion of Results

Regarding the board independence, the results are in agreement with the stakeholders' theory which buttresses the need for having non-whole time service directors in the board in order to protect the investors' interest (Arayssi, Dah, and Jizi, 2016). In support of this view as well is a meta-analysis approach adopted by García- Meca and Sánchez-Ballesta (2010) that documented that a positive and significant relationship between BI and ESD "only occurs in those countries having investor protection rights". Further, the theory is emphasized by Post, Rahman, and McQuillen (2014) that a higher degree of non-whole time service directors being on the board is expected to associate to extensive ecological effect reporting significantly.

For Ofoegbu, Odoemelam and Okafor(2018) study in Nigeria and South Africa, the board independence was statistically significant for the Nigeria sample (applying traditional reporting framework) but not significant for the South Africa sample (applying Integrated Reporting). For the Nigeria findings, they were attributed to strong corporate governance arrangementsthat may serve as bonding strategies in weak legal environments (traditional reportingframework), a suggestion of a substitutive association between corporate governance and theregulatory framework. It implied that the non-executive inclusive board acts as a dimension ofa better-governed firm, thus ensuring the reduction of information asymmetry (Ernstberger and Grüning, 2013). This implies that South African legal and regulatory framework (IR) is strong (Khlif *et al.,* 2015) which substituted the degree of South Africa ecological reporting while the non-executive board of directors in Nigeria listed firms compensated for the poor regulatory environment (Adegbite,

2015). In the same vein, Odoemelam and Okafor (2018) justified the stakeholder theory on the basis that in an ecology coupled with weak legal and institutions, more of whole-time service directors will ensure stakeholders protection of their interest.

Contrary to the findings is by Akbas (2016), whose results found no statisticallysignificant association between the degree of ecological reporting and board independence. This could be attributed to the use of a sample other than the entire population. In addition, the study was limited to non-financial firms.

On the board size, the findings agree with those of Andrikopoulos and Kriklani (2013); Akbas (2016). They are buttressed by the stakeholder's theory and legitimacy theory, that a larger number of board of directors positively statistically significant influence on the outcome of the sustainability report as a result of diversified knowledge and skills (Honggowati *et al.,* 2017). In consonance with the result as well is Du Hong Vo and Nguyen (2014) that a larger board has diversification in handling issues as well asenhancing the effect of firm to society as a result of the association of members in Board. Further, entities with several directors are able to exploit more resources from the without compared to others so as to improve on their performance. Agency theory also supports large boards (John and Senbet, 1998) as a result of the expertise diversity (Allegrini and Greco, 2013). However, other studies indicated a negative association (Uwuigbe *et al.,* 2011) while other insignificant findings (Cheng and Courtenay, 2006; Michelon and Parbonetti, 2012).

However, board diversity and board meetings were negatively correlated with environmental sustainability disclosure. On the other hand, ownership concentration was not correlated with environmental sustainability disclosure. These findings tend to support the legitimacy theory that in a poorly regulated environment with voluntary disclosure perspective (traditional reporting framework) as compared to the mandatory reporting perspective (integrated reporting framework), the discretionary disclosure substitute legitimacy disclosure. The results of the board diversity negates the trinity theory (stakeholder theory, legitimacy theory and agency theory) (Odoemelam and Okafor, 2018) that expects a diverse board, having female gender representation to help propagate the implementation of social welfare activities such as firm operations being environmentally sensitive in terms of its products and emissions.

On the board meetings, the frequency board activities are expected to have positive influence on the level of ecological disclosure (Beekes *et al.,* 2016; Prasad *et al.,* 2017). The board meetings result also contradict the argument that frequency of the board meetings enhances the quantity of environmental disclosure and will help overcome agency conflicts (Ntim and Osei, 2011; Osazuwa *et al.,* 2016).In consonance with the results was Osazuwa*et al.* (2016), an indication that there was no much board activity. However, Odoemelam and Okafor (2018) results were contrary. This could be attributed to the utilization of cross-sectional data unlike the current study using longitudinal data. Also, the study was limited to the annual reports in comparison to the current study that used varied secondary data sources. Further, the contrary findings could have been attributed to the exclusion of

some segments such as the financial firms, as it was limited to non-financial firmsonly.

Generally, the moderated results though indicating varied effect (either positive or negative), were statistically significant. This is contrary to Ofoegbu and Megbuluba (2016) whose findingsrejected the alternative hypothesis, thus concluding that firm financial strength does not affect the quality of Corporate Environmental Accounting Information Disclosure (CEAID) in the Nigeria manufacturing firms.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Thischapterpresentsthesummary ofthefindings,conclusions derivedfromthefindings,and therecommendationsthatwillhelpinimproving environmental sustainability disclosure.Areasoffurtherstudyarealsosuggested.

5.2 Summary

The study collected data from 56 listed firms at the Nairobi Security Exchange (NSE) during the financial year 2017/2018. It covered a period of 5 years from the years 2013 to 2017. Over the study period,board independence ranged from 68% to 79% while board diversity ranged from 16% to 21% during the study period. On average, the board meetings were 4 per year while the board was composed of an average of 8 members. Furthermore, there has been an increase in ownership concentration over the years while institutional ownership has been on the decline. Besides, the audit committee was composed of 4 members while the audit committee independence from 45% to 53% during the study period.

Diagnostic tests were conducted to ascertain whether the panel data met the assumptions of the regression model. The findings indicated that there was no violation of the assumption of normality, heteroskedasticity, multicollinearity and unit root. The implication is that there was a normal distribution of the residuals and the mean and variance in the data do not depend on time. As well, there was no serial correlation.

The correlation results indicate that there was a positive relationship between board independence, board qualification, institutional ownership, audit committee independence, audit committee meetings, firm size and board size with environmental sustainability disclosure.

Board diversity and board meetings were negatively correlated with environmental sustainability disclosure. On the other hand, ownership concentration was not correlated with environmental sustainability disclosure. In addition, hypothesis testing was done with the fixed effects model whereby 64% variation in environmental sustainability disclosure was explained by board independence, board diversity, board qualification, board meetings, ownership concentration, institutional ownership, audit committee independence, audit committee meetings and board size.

The moderation findings indicated that financial strength positively moderates the relationship between board independence and environmental sustainability disclosure. However, financial strength weakens the relationship between board diversity and environmental sustainability disclosure. Similarly, financial strength has a negative and significant moderating effect on the relationship between board meetings and environmental sustainability disclosure, thus buffering the association.

In terms of internal controls, financial strength has a positive and significant moderating effect on the relationship between institutional ownership and environmental disclosure. However, financial strength weakens the relationship between ownership concentration and environmental disclosure. Regarding the ownership structure, financial strength has a negative and

significant moderating effect on the relationship between the audit committee meetings and environmental disclosure. Finally, there is a positive and significant moderating effect of financial strength on the relationship between audit committee independence and environmental sustainability disclosure.

5.3 Conclusions

The study assessed the influence of board characteristics on environmental sustainability disclosure. The focus was on board size (control variable), board diversity, board independence and board qualification. With reference to board size, the results showed that there is a positive relationship between the board size and the level of environmental disclosure. Where the increase in the number of members of the board provides a variety of knowledge and expertise that reduce the problem of the agency and contribute to enhancing the capabilities of the board members.

However, board diversity had a negative and significant influence onenvironmental sustainability disclosure. The findings are in contrary to the notion that firms with higher levels of board diversity exhibit higher incidences of environmental sustainability disclosure. There is thus need for further studies on the same to ascertain the validity of the findings.

The study results have shown that having a large proportion of independent directors on the board lead the firms listed in NSE to increase their environmental sustainability disclosure. This implies that the more the firms have external directors, the more they participate in environmental disclosure. This is due to the fact that external directors are independent of management and are more effective in protecting the interests of shareholders and have an

understanding of the external environment. A balanced board is therefore important for balanced board composition and enhanced environmental sustainability disclosure.

Further, board qualification was associated with an increase in environmental sustainability disclosure. The implication is that the quality of the board in terms of their professional qualification, experience and talents are key in enhancing environmental sustainability disclosure. Finally, findings on board characteristics,the number of board meetings had no influence on environmental sustainability disclosure. Therefore, increase in the number of board meeting will have no influence on environmental disclosure.

In addition, institutional ownership had a positive influence on environmental disclosure. This suggests that concentrated ownership by one institution owning more than 50 percent of a company's shares, the more favourable it is in relation to enhancing environmental disclosure. This supports the legitimacy theory, in the sense that the controlling institution may want to gain more social legitimacy by signaling out more information to the public, hence reducing information asymmetry among the various stakeholders. On the other hand, ownership concentration had a negative and significant influence on environmental sustainability disclosure.

Audit committee meetings had no significant effect on environmental sustainability disclosure. The findings are in divergence with the notion that frequent audit committee meetings provide for an avenue to ensure that the committee is able to fully attend and address to all its mandates, the most important one being thoroughly scrutinizing the firm's reports. This will

enable the committee to determine if the firm is compliant with all reporting guidelines including environmental sustainability disclosure (under GRI). It appears therefore that an increase in the audit committee meetings of listed firms in NSEs has no influence on environmental disclosure.On the flipside, audit committee independence had a positive and significant effect on environmental sustainability disclosure.The significant positive findings suggest that independent audit committee members who are free from management influence seems to work effectively in monitoring managers' actions, and therefore enhancing environmental sustainability disclosure.Therefore, from the study findings, several contributions to new knowledge can be deduced as follows:

Financial Strength as interacting term has a significant influence on the relationship between corporate governance (measured by board characteristics, ownership structures and internal controls)and environmental sustainability disclosutres, therefore advancing theory.

Environmental sustainability disclosures is vital to all firms, both large and small one in terms of the asset base, as well as firms whose operations has direct or indirect effects on the ecological degradation.

Extensive four dimensional framework for assessing environmental disclosure quality is appropriate in proper assessment of firms' ecological reporting. This is coupled with the semantic assessment other than volumetric measurement.

Finally, based on the overall results that have showed significant effect of corporate governance mechanism as well as financial strength towards environmental sustainability disclosures, the study concludes that the

accounting profession through corporate governance (an aspect of corporate reporting), have a significant role to play towards the realization of environmental sustainability (one of the globally adopted Sustainable Development Goals).

5.4 Recommendations

More attention is needed in terms of policy enactment towards ensuring that firms are fully accountable for their operations deemed to be environmentally harmful through comprehensive environmental disclosures. This is evidenced by the significant interaction effect of financial strength on the relationship between corporate governance and environmental sustainability disclosure, as a result of firms having different asset base.

The study has exhibited a significant relationship between board size and environmental sustainability disclosure. Consequently, there is need for organizations to have a balanced board size-one that is not too small or too large so that the board can benefit from knowledge and expertise that reduce the agency problem. This is because a small board size may be compromised by some parties with their own interests. Such a board will make it possible for the organizations to protect the interests of the shareholders and at the same time have better environmental sustainability disclosure.

Board diversity, measured in terms of gender diversity, was found to reduce environmental sustainability disclosure of firms listed in NSE. There is thus need for future studies to focus on specific dimensions such as experience, age, and nationality of the board to establish if they indeed predict environmental sustainability disclosure.

Since board independence has a significant influence on environmental sustainability disclosure, it is utmost necessary to have a balanced board composition. Therefore, there is need to add outside directors to the board so as to keep the independence of the board. This is because outside directors are independent of management and more effective in protecting the interests of shareholders and enhancing environmental sustainability disclosure. Moreover, they are well aware of the external environmental dynamics which is paramounttowards enhancing environmental sustainability disclosure.

Some of the studies reviewed had corporate environmental committee incorporated in the firms' annual reports, under the corporate governance structure. The study recommends establishment of similar committee in firms' corporate governance structure. This will help in spearheading ecological matters.

Furthermore, the study has indicated that institutional ownership is most preferred when it comes to enhancing environmental disclosure. More so, on matters regarding environmental disclosure, higher ownership by the regulatory authorities is paramount since as it will influence compliance and disclosure. So, when it comes to increasing environmental disclosure, it is recommended that regulators promote this concentrated institutional ownership, especially government ownership. However, before doing so, it is very important to implement rigid laws on minority rights. To a great extent, the research found that institutional ownership, if efficiently utilized, could help in enhancing environmental sustainability disclosure.

This study focuses on NSE listed firms inKenya. Further studies can as well examineecological sustainability disclosure issues for small-and-medium enterprises (SMEs), as they are also facing sustainable development issues, and dealing with them in an unobservable way. Studies on SMEs can add value to the contemporaneous ecological sustainability literature from a new dimension.

Finally, audit committee independence results in better environmental sustainability disclosure. Therefore, firms listed in NSE need to have audit committees with a majority of independent directors so as to elicit high environmental disclosure levels. Also, the composition of independent audit committee members needs to be increased since they are likely to make independent decisions to improve environmental disclosures of firms listed in NSE without being manipulated.

5.5 Suggestions for Further Research

Based on the research hypotheses

H_{o1a} Directors tenure in the board as well as cross-directorship of the directors with regard to serving on more than one board.

H_{o1b} Relationship between women present in corporate boards & ESD. In addition, uptake of the women in the leadership roles such as the chairmanship. Further, the effect of “glass ceiling” concept for women as board members where they are viewed by the male directors as a form of tokenism.

H_{o1c} Possession of environmental education by the directors, their tribal affiliation with regard to nationality as well astheir age.

H_{o1d}Board meetings attendance by the directors.

H_{o2a}Government share ownership in the firms and the resulting effects on corporate environmental disclosures.

H_{o2b}Individual shareholders shareholding capacity versus shareholding by firms.

H_{o3a}Attendance of the meetings by the directors

H_{o3b} Composition of audit committee in terms of directors possessing environmental related knowledge.

General recommendations

There are numerous opportunities for further research. For instance, accounting for more firm characteristics such as those pertaining to the audit committee and see how they impact on environmental sustainability disclosure. For example, they can be accounted for from different perspectives such as size and expertise.

Also, future research can further explore the impacts of different industry-types. In order to more confidently generalize the findings, future research could investigate a larger scale of companies. This could be achieved by assessing the firms' annual reports as a survey form handed out to one of the people responsible for its preparation, rather than having the researcher

examine all the annual reports. This would overcome the timely process of assessing each annual report.

Future research can be executed on two different time periods such as before the release of some new law or guideline pertaining to environmental disclosure and after its release. For instance, some years before the release of a particular environmental disclosure law and others after, such as the release of the International Financial Reporting Standards (IFRS) on new reporting framework, Integrated Reporting (IR) with effect from the year 2014, from the traditional reporting framework. The traditional reporting framework was based on voluntary ecological disclosure while integrated reporting is premised on mandatory ecological disclosure. The results of such research will generate an idea of how environmental disclosure laws are implemented in Kenya. Additional research could be conducted in other countries (emerging or developed) using the same tested variables. This would allow a cross-country comparison. Such additional studies would provide a cross-country comparison between an emerging market (Kenya) with that of a developed market to compare and contrast different behaviours by institutions with regard to enhancing environmental disclosure. Or, a cross-country comparison of two emerging markets to determine if similar results were generated.

On the data collection instruments, further studies could consider use of both the primary data and secondary data in order to supplement the available secondary data with the stakeholder's opinions about corporate ecological reporting and what more is required to ensure firms are fully environmentally compliant. Moreover, in applying the current corporate governance structures, only three committees are reported. With the adoption of the integrated

reporting framework, it brings in the environmental sustainability committee within the board to oversee the areas of environmental management. Future studies can explore the role of the environmental sustainability committee in the CG – ESD association.

Further, more environmental disclosure variables such as environmental fines and environmental prosecutions against firms can be included as part of GRI reporting items to have a wide overview of ecological disclosures. Institutional ownership could also be categorized in a different manner than the one utilized by this research. For instance, they could be categorized as active and passive or as those who are part of management and those who are not. Lastly, future research could be conducted on the influence of audit committee meetings, and the number of board meetings on environmental sustainability disclosure since the study exhibited no relationship among these variables.

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APPENDICES

Appendix I: Corporate governance disclosure data collection checklist

	2013	2014	2015	2016	2017
a) Board Characteristics					
i. Board qualifications (education)					
ii. Board diversity					
iii. Board meetings					
iv. Board size (No. of directors)					
v. Non-executive directors					
b) Ownership Structures					
i. Institutional ownership					
ii. Ownership Concentration					
c) Internal Controls					
i. Audit committee independence					
ii. Number of audit meetings					
d) Financial Strength					
i. Firm size (asset base)					

Appendix II: Quantitative Corporate Ecological Reporting Checklist

	Corporate Ecological Reporting Information	
		Presence/ Absence
1	**Ecological Policies**	
	Real ecological policies statement	
	Pollution mitigation equipment as well as the available facilities	
	Research and development expenses towards pollution reduction	
	Ecological provisions and contingent liabilities	
	The section/unit established for management of ecological issues	
	Utilization, conservation and saving of the unused energy	
	Health and safety measures	
	Effects of ecology researches	
	Historical, present, and future approximates of development and recurrent expenses towards ecological mitigation	
2	**Ecological sustainability**	
	Ecological sustainability program	
	Sustainable development goals implementation	
3	**Ecological laws and standards adherence**	
	Adherence with regulations as well as guidelines on health and safety issues	
	Adherence with pollution policies and regulations	
	Adherence position with ecological and/or health as well as safety procedures like ISO 14001, and EMAS	
	Address on ecological policies and procedures	
4	**Ecological associated products and procedures concerns**	
	Transaction with green bonds	
	Waste management	
	Recycling	
	Safeness of the product	
	Discharge of effluents as well pollution emission	
	Recycling and re-use	
	Products packaging	
	Products as well as product development	
	Maximum utilization of the raw materials used in production process	
5	**Other information associated to ecology**	
	Ecological awards for protection and adherence such as FIRE award	
	Engagement in anti-waste disposal education	
	Ecological penalties and fines on flouting the ecological laws and regulations	
	Organizing as well as facilitating workshop, conferences, seminars for training on ecological issues	
	Conservation of the wildlife	
	Any other ecological matters not captured	
	Contingent liability data	

Appendix III: Decision rules for environmental disclosure quantity

Any disclosure item that discusses or mentions the natural environment aswell as health and safety and/or their relationship to the organization isrecorded.

All disclosures must be explicitly stated, they cannot be implied meanings.

All disclosures that fit within the categories and items are to be included nomatter how much it is advertising.

All disclosure items are to be recorded regardless of their format, includingfinancial statements, narratives, and non-narratives such as pictures,photographs, charts and graphical representations.

Disclosures having more than one possible classification or containing two ormore information items are classified under each relevant category or item.

Repeated disclosures are not recorded, disclosures containing the sameinformation item are considered only once.

Appendix IV: NSE listed firms sectors

S/No	Segments/Sectors	No. of firms
1	Agricultural	7
2	Automobiles and Accessories	1
3	Banking	11
4	Commercial and Services	12
5	Construction and Allied	5
6	Energy and Petroleum	5
7	Insurance	6
8	Investment	5
9	Investment Services	1
10	Manufacturing and Allied	9
11	Telecommunication and Technology	1
12	Real Estate Investment Trust	1
13	Exchange Traded Fund	1
	Total firms	**65**

Appendix V: Operational definition of corporate governance variables

Variable	Operationalized term	Data Source
Independent variables		
Role Duality	A dummy value equals to one (1) when the CEO is as well the chairperson, otherwise zero (0)	Firm end year reports
Board Size	Total number of the board of directors	Firm end year reports
Non-executive directors	The ration of the non-whole time service directors in the board	Firm end year reports
Board Meetings	Total number of board meetings held in a year (12 months)	Firm end year reports
Board diversity	The ration of women in the board	Firm end year reports
Directors qualifications (Education)	The ration of the board of directors possessing any finance and/or accounting background	Firm end year reports
Ownership Concentration	The fraction of total securities owned by the blockholders in excess of three percent (3%)	Firm end year reports
Audit Committee Independence	Share of autonomous non-whole time service directors comprising the audit committee	Firm end year reports
Number of audit committee meetings	Total number of audit meetings held in a year (12 months)	Firm end year reports
Moderating variables		
Financial Strength	Natural logarithm of total firm's assets	Data Stream database
Dependent variables		
Corporate Environmental Sustainability Disclosure Quantity	Fraction of classified quantity scores awarded in regard to maximum applicable classified quantity score	Firm end year reports
Corporate Environmental Sustainability Disclosure Quality	Fraction of classified quality scores awarded in regard to maximum applicable classified quality score	Firm end year reports

Appendix VI: Decision rules for Environmental Disclosure Quality

- *Kind: Financial Quantitative/Non-financial Quantitative/Declarative classification*

A reporting item combination consisting of two or all three disclosure typesof financial quantitative, non-financial quantitative and declarativeinformation is categorized as containing the method of measure having the top most quality. Financialquantitative reportingwas accorded the top most priority, with non-financialquantitative reporting having the second priority while declarative reportingpossessing the lowest priority. This was in a situation where there are multiple kinds of in one reporting item.

- *Direction: Good/Bad/Neutral categorization*

A reporting item classified as comprising good or bad informationshouldhave specified and comprehensive information which make its economic direction clear.

- *Outlook: Future oriented/Past categorization*

A reporting item having both future oriented and past information is categorized as having the time phenomenon withhigher quality. Future orientedreporting have higher priority over past reportingwhere there is multiple outlooks in one reporting item.

- *Validity: Valid/Not Valid categorization*

A reporting item is categorized as having valid information whereeither of three conditions are present: (1) the reporting is contained in one of the externallyaudited sections of the end year report; (2) the autonomous auditor report extensively and clearly states that the environmental report is audited; and/or (3) the end year report has a reference in any part to an environmental

reporting audit which iscarried out. Otherwise the reporting is categorized as not valid.

Appendix VII: Corporate Ecological Reporting Checklist

	Corporate Ecological Reporting Information	Kind			Direction			Outlook		Validity	
		Financial Quantitative (3)	**Non-financial Quantitative (2)**	**Declarative** (1)	**Good** (2)	**Bad** (2)	**Neutral** (1)	**Future** (2)	**Past** (1)	**Valid** (2)	**Not Valid** (1)
1	**Ecological Policies**										
	Real ecological policies statement										
	Pollution mitigation equipment as well as the available facilities										
	Research and development expenses towards pollution reduction										
	Ecological provisions and contingent liabilities										
	The section/unit established for management of ecological issues										
	Utilization, conservation and saving of the unused energy										
	Health and safety measures										
	Effects of ecology researches										
	Historical, present, and future approximates of development and recurrent expenses towards ecological mitigation										
2	**Ecological sustainability**										
	Mentioning of sustainability										
	Mentioning of sustainable development										
	Mentioning of sustainable										

	development goals										
3	**Ecological laws and standards adherence**										
	Adherence with regulations as well as guidelines on health and safety issues										
	Adherence with pollution policies and regulations										
	Adherence position with ecological and/or health as well as safety procedures like ISO 14001, and EMAS										
	Address on ecological policies and procedures										
4	**Ecological associated products and procedures concerns**										
	Transaction with green bonds										
	Waste management										
	Recycling										
	Safeness of the product										
	Discharge of effluents as well pollution emission										
	Recycling and re-use										
	Products packaging										
	Products as well as product development										
	Maximum utilization of the raw materials used in production process										
5	**Other information associated to ecology**										
	Ecological awards for protection and adherence such as FIRE award										
	Engagement in anti-waste disposal education										

	Ecological penalties and fines on flouting the ecological laws and regulations										
	Organizing as well as facilitating workshop, conferences, seminars for training on ecological issues										
	Conservation of the wildlife										
	Any other ecological matters not captured										
	Contingent liability data										
	TOTAL										