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EXPLORING SUSTAINABLE PROCUREMENT PRACTICES WITHIN THE NIGERIAN OIL AND GAS SECTOR

By:

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

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DECLARATION

In presenting this thesis, I hereby certify that this work is my own work, except for those areas where acknowledgements are duly made.

LIST OF ABBREVIATIONS

BBC – The British Broadcasting Corporation

BSI – British Standards Institute

CFA – Confirmatory Factor Analysis

CIA – Central Intelligence Agency

CSR – Corporate Social Responsibility

DPR – Department of Petroleum Resources, Nigeria

EEI – Economic & Environmental Improvement

EFA – Exploratory Factor Analysis

EGASPIN – Environmental Guidelines and Standards in the Petroleum Industry in Nigeria

EIA – Environmental Impact Assessment

ESI – Equality & Safety Improvement

GHG – Greenhouse gas

GSCM – Green Supply Chain Management

ISO – International Standards Organisation

NESREA – National Environmental Standards and Regulations Enforcement Agency

NNPC – The Nigerian National Petroleum Corporation

NOSDRA – National Oil Spill Detection and Response Agency

O&G – Oil and Gas

OPEC – Organisation of Petroleum Exporting Countries

PSR – Purchasing Social Responsibility

SC – Supply Chain

SCI – Social & Community Improvement

SCM – Supply Chain Management

SEM – Structural Equation Modelling

SP – Sustainable Procurement

SPSS – Statistical Package for the Social Sciences

SSCM – Sustainable Supply Chain Management

TBL – Triple Bottom Line

UN – United Nations

ABSTRACT

Although sustainable procurement (SP) practices literature is increasingly evolving - especially from the European context - this innovative approach to sustainability is hardly heard of, discuss or appears to be present in the Nigerian context. In particular, it lacks formal sustainability criteria for the procurement of goods and services in the O&G sector – a key sector of the Nigerian economy - despite the fact that SP can lead to sustainable development. This situation is evidently responsible for the lack of SP studies within the Nigerian O&G sector. Hence, this thesis sets out to determine the underlying dimensions of sustainable procurement (SP) practices and to empirically examine the relationships among SP practices, procurement sustainability strategy and initiatives, and the impact of SP practices on firms' performances within the Nigerian O&G sector. To achieve its purpose, an in-depth literature review of SP practices and related terms was conducted, upon which the initial conceptual framework for this research is built.

Primary data was collected from the Nigerian O&G upstream sector after ethical and industry approval from the University of Salford and Department for Petroleum Resource (DPR) Nigeria, respectively. A total of 51 valid responses were obtained for the data analysis, which utilised exploratory factor analysis (EFA), hierarchical multiple regression models, cross tabulation and confirmatory factor analysis (CFA). The reliability and validity of scales and results obtained were also confirmed with the aid of appropriate tools.

The EFA led to the extraction of three factors, which were subsequently named *social & community improvement (SCI)*; *economic & environmental improvement (EEI)* and *equality & safety improvement (ESI)*, due to the factor loadings and in line with assumptions held in the literature review. The results suggest that SP practices are environmental, social or economic oriented have some degree of relationship. The hierarchical multiple regression models indicate a statistically significant relationship between *clear SP strategy* and all three factors of SP practices but display a partial relationship between the sustainability initiatives (ISO 14001 certification and UNGC initiative) and all three factors of SP practices. For example, the results indicate that ISO 14001 certification is only statistically significant with *SCI* and *ESI*

factors of SP practices, whilst UNGC initiative is only statistically significant with *SCI* and *EEI* factors of SP practices. In regard to performances, the results showed a perceived impact on firms' financial and non-financial performances as a result of SP practices. For instance, the findings indicate that SP practices have perceived positive impacts on the quality of products and services, sales and revenue. The findings also highlight the fact that SP practices may lead to increase in market share and customer loyalty.

The findings of the research provide useful insights into SP practices within the Nigerian O&G sector. These insights may help practitioners to focus on those SP practices (the three factor loadings) that can lead to sustainability, especially where there is a scarcity of resources in operationalising SP practices. Furthermore, insights were gained on the link between the drivers examined in the multiple regression and the adoption of SP practices. Further, it is worth noting that this empirical research is one of the first to investigate SP practices within the Nigerian O&G sector, and therefore, expected to lead to further studies and debates needed to advance SP practices.

Keywords: *sustainable procurement, sustainability, oil & gas, firms' performance, Nigeria*

CHAPTER ONE: RESEARCH BACKGROUND

1.1 Introduction

There has been a persistent call for a more sustainable way of living and undertaking business activities in the last 25 years due to climate change, resource depletion, environmental, economic and social issues. This has subsequently made the sustainability concept popular and accepted globally by both individuals and corporate bodies. For instance, carbon dioxide (CO_2) emissions constitute about 72% of possible global warming (Rohrer, 2007), apparently making it the main cause of global warming. Approximately 70% of global greenhouse gas (GHG) emissions are because of energy-related activities. Of this 70%, approximately 60% are from the O&G sector i.e. approximately 42% of global GHG, making this sector a prime contributor to the world's GHG emission (IIGCC, 2016). In stressing the significance of climate change, the president of the United Nations (UN) noted thus:

> *"Recognizing that climate change represents an urgent and potentially irreversible threat to human societies and the planet and thus requires the widest possible cooperation by all countries, and their participation in an effective and appropriate international response, with a view to accelerating the reduction of global greenhouse gas emissions,"* (UN, 2015, p. 1).

The above-noted issues contributed to helping to publicize the sustainability terms, which is also often referred to as sustainable development. Sustainability takes an encompassing approach to the environmental, social and economic performance of firms (Ahi and Searcy, 2013), and often referred to as *'triple bottom line'* (TBL) since it considers the welfare of stakeholders as well as the firm's reputation (Heizer and Render, 2014). There is an extensive number of definitions for sustainability. The original Brundtland's Commission definition cited in Glavic and Lukman (2007, p. 1884) defined sustainability as *"…development that meets the needs of the present without compromising the ability of future generations to meet their own needs".* However, in a business context, it is referred to as *"…meeting the needs of a firm's direct and indirect stakeholders, without compromising its*

ability to meet the needs of future stakeholders" (Martinez-Jurado and Moyano-Fuentes, 2014, p. 5).

As environmental and social challenges mount due to pressure from government agencies, stakeholders, customers and competitors, firms are increasingly acknowledging their responsibility of improving the environmental and social impacts of their activities by adopting strategic measures that can help improve their businesses and operations processes (Ashby et al., 2012). These measures are adopted not just to meet the needs of stakeholders, but also the needs of firms, to demonstrate their commitment to sustainable development (McMurray et al., 2014). A key instrument to achieving sustainability by firms according to scholars is the involvement of the procurement function (Aragão and Jabbour, 2017; Islam et al., 2017b; Walker and Brammer, 2009). Procurement is generally defined as the act of obtaining goods and services. In Burt and Pinkerton (1996, p. 21) procurement refers to as the *"systematic process of deciding what, when, and how much to purchase; the act of purchasing it; and the process of ensuring that what is required is received in the quality specified on time"*. This definition certainly supports the notion that procurement is not just a tactical function but a strategic function, as it not only entails the purchasing activity but other activities that led to the purchasing together with the management of such purchased items. Apart from suffering from a unanimous consensus as to whether the procurement is a strategic or tactical function, the difference between supply chain management and procurement is still unclear. This study, however, strongly asserts the procurement function as a strategic function (Mena et al., 2014).

Sustainable procurement (SP) as a concept originated in response to the "sustainability" or "sustainable development" concept (Erridge and Hennigan, 2012; Kalubanga, 2012). SP emphasizes the role of the procurement function, which includes but is not limited to sourcing, contracting, monitoring, evaluation and expediting (Kalubanga, 2012), while reducing the environmental, social and economic impact of firms' activities (Hughes and Laryea, 2013) thereby leading to sustainability. In general, these activities are driven by SP practices, which require a focal firm to assess its sustainability practices from its suppliers and examine the impact of products and services on the environment and community (Rao

and Holt, 2005). Sustainability practice is a requirement that firms ought to fulfil (Carter and Rogers, 2008) to tackle critical issues of climate change, resource depletion, environmental degradation, global poverty, air pollution, and other social and ethical issues. In this regard, SP has been tipped as an appropriate measure for firms to realize this objective, because the procurement function has close links with firms' suppliers and can instil them to tackle issues of sustainability within the supply chain. Aragão and Jabbour (2017) concurring to this view, noted that SP is not just a tool for safeguarding the environment, but also a tool for economic and social development. The need for this innovative approach to sustainable development cannot be overemphasised, considering the benefits SP practices can bring to a practising firm, e.g. cost savings, competitive advantage, good reputation, reduced waste and reduced risks (Islam et al., 2017a).

The growing attention paid to environmental and social issues is reflected on the concurrent implementation of sustainability measures, such as green procurement, sustainable manufacturing, sustainable distribution, SP and sustainable supply chain management (SSCM), to tackle issues of environmental and social challenges to bring about a sustainable world. In addition, there is a growing number of academic researches stimulating the application of SP within government and corporate firms' operatives (Grandia, 2016; Islam et al., 2017a; McMurray et al., 2014; Walker and Brammer, 2009). The diffusion of SP practices within public and manufacturing firms exist to a greater extent as practitioners have welcomed this new approach with the intent of reducing the negative impact of their activities on the environment and society. Considering the significance accorded to sustainability issues and the negative impact of O&G activities on the environment, there is huge pressure on O&G firms to adopt a more environmentally friendly approach to the exploration, production, refining, and distribution of O&G products. To address these issues, O&G firms have taken different steps in implementing environmental and social initiatives that could help lessen or eliminate their negative impacts (Ahmad et al., 2016a; Silvestre, 2015; Yusuf et al., 2013). However, there is little evidence to suggest, specifically, that SP practice is one of such initiative adopted within the O&G sector, especially in the context of this study.

The scope of this research is critical considering the impact of the O&G sector on resource depletion, environmental degradation as well as air and water pollution (Shuen et al., 2014). The O&G sector is generally more exposed to environmental allegations when compared to other sectors (Musa et al., 2013), making it suitable for research work of this magnitude. Furthermore, evidence revealed that the O&G sector, unlike other sectors, is lagging in the adoption and implementation of sustainability measures (Schneider et al., 2011; Schneider et al., 2013; Yusuf et al., 2013) and SP practices in particular (Rice, 2009). This is despite the growing pressure on multinational O&G firms to help improve the socioeconomic, environmental and cultural well-being of their host communities in developing countries where they operate (Musa et al., 2013). Furthermore, whereas aspects of SP practices have been studied in developed countries, where there are several guidelines and reports to help overcome SP challenges, there is a dearth of such efforts and studies in the O&G sector of emerging and developing countries (Oppong, 2014), except for a few (Silvestre, 2015; Ahmad et al., 2016a, 2016b).

Based on the above evidence and discussion, one could argue that this research is motivated by the shortage of SP research in developing countries and the O&G sector, especially with regards to Nigeria, where the environmental, social and economic impacts of O&G activities have caught the eyes of global media over the years (Musa et al., 2013). While this observation is true, it is observed from the extant literature that the only way to encourage SP implementation is by gaining a good understanding of the concept itself (Grandia, 2016). Some events that has been on the limelight include environmental degradation such as land pollution, the air pollution and water pollution in the Niger Delta region (Uzoechi, 2013); corruption and the execution of Ken Saro-Wiwa - an environmental activist from Ogoni Land - along with eight other persons (Donwa et al., 2015; Nwapi, 2015; Ugwuanyi, 2018; White, 1999). Although an in-depth literature review revealed the dearth of exclusive research on SP within the O&G sector globally, this is not the scope of this research, which is solely looking at SP from the context of a developing country.

1.2 Overview of Nigeria and the O&G sector

Nigeria is a country located in the west of Africa with a land area of 910,768 sq. km and a water area of 13,000 sq. km making a total of 923,768 sq. km and an estimated population of 186,053,386 people speaking more than 500 languages (CIA, 2017). Crude oil remains the main source of economy generation for Nigeria since the detection of Oil in the Niger Delta region of the country. Following the discovery of oil in the Niger Delta region, Nigeria has been a key player in the world's oil industry and one of the largest oil-producing nation in Africa. It has also been an active member of the Organisation of Petroleum Exporting Countries (OPEC) since 1971, whose headquarters is presently situated in Vienna, Austria (OPEC, 2016). Due to the high demand for O&G products around the world, Nigeria has experienced a surge in its revenue, which has helped in the improvement of its infrastructures.

This high demand ultimately made the O&G sector a key source of economy not only to Nigeria but to the world in general (Alazzani and Wan-Hussin, 2013; Ibrahim, 2008), serving as a major source of energy, innovation and employment, and a cradle of revenue especially in oil-producing countries (Buldybayeva, 2014). For instance, in Nigeria O&G accounts for about 80% of its revenue, contributes an average of 9.4% to the country's gross domestic product (GDP) and creates job opportunities for its citizens (Amujo et al., 2015; National Bureau of Statistics, 2018). As well as being a major contributor to the Nigerian economy, the O&G sector has been linked to several corruption activities taking place in the country (Donwa et al., 2015; Nwapi, 2015). These acts of corruption are believed to be the main cause of the underdevelopment and high level of poverty the country is experiencing (Adegbite et al., 2012). All these facts inspired the researcher, who is also a Nigerian, to undertake this research from the Nigeria perspective, where SP practices have been under-researched to date. The above justifications, therefore, explain why this research focus on Nigeria.

In addition, while it has been noted that government and public organizations are to act as a benchmark and exert pressure on firms to follow environment-friendly methods of procurement (Mansi, 2015; Walker and Brammer, 2009), the author argue that the well-

structured multinational O&G firms in the context under study can also help in facilitating the adoption of SP practices. This is because the country under study has a known history of corruption, lack of commitment and lack of innovative infrastructures within government organizations, which hinders the progress of sustainable development in the country (Adegbite et al., 2012). In addition, there is evidence to assume that sustainability measures taking place in Nigeria are because of the multinational O&G firms (Ite, 2004; Musa et al. 2013). Undertaking this research in the O&G sector, which has within it, firms with global presence operating within countries known for their operational best practices is the right path to drive the sustainability crusade within this country that depends heavily on the O&G sector for revenue.

As highlighted earlier on, the activities of the O&G sector constitute severe negative environmental, social and economic hardship to the communities where they operate and the public (Saad et al., 2014). This includes gas flaring, oil spills, air pollution, loss of cultural values in communities where they operate and other issues of health and safety. Correspondingly, O&G firms have adopted different sustainability measures to tackle these negative impacts. However, their efforts have proven to be inadequate, insufficient, unsatisfactory or ineffective (Rice, 2009; Schneider et al., 2011; Schneider et al., 2013). Therefore, this research seeks to determine the underlying dimensions of SP practices, examine the relationships among SP practices, procurement sustainability strategy and initiatives and determine whether such practices can improve firms' performances within the O&G sector.

This research focuses on investigating SP practices within the Nigerian O&G sector. The Nigerian O&G sector, like other O&G sectors, is divided into upstream, midstream and downstream with activities ranging from exploration, development, production, transportation, refining to retailing (Shuen et al., 2014), which constitute the O&G value chain as comprehensively presented by Oyejide and Adewuyi (2011). In addition, within the O&G sector, there are operators, contractors, sub-contractors, suppliers, and consultants. The above analysis illustrates are broad the O&G sector is. To narrow the scope of this

research, the emphasis of this current research is on the activities of the upstream O&G sector as represented in Figure 1.1.

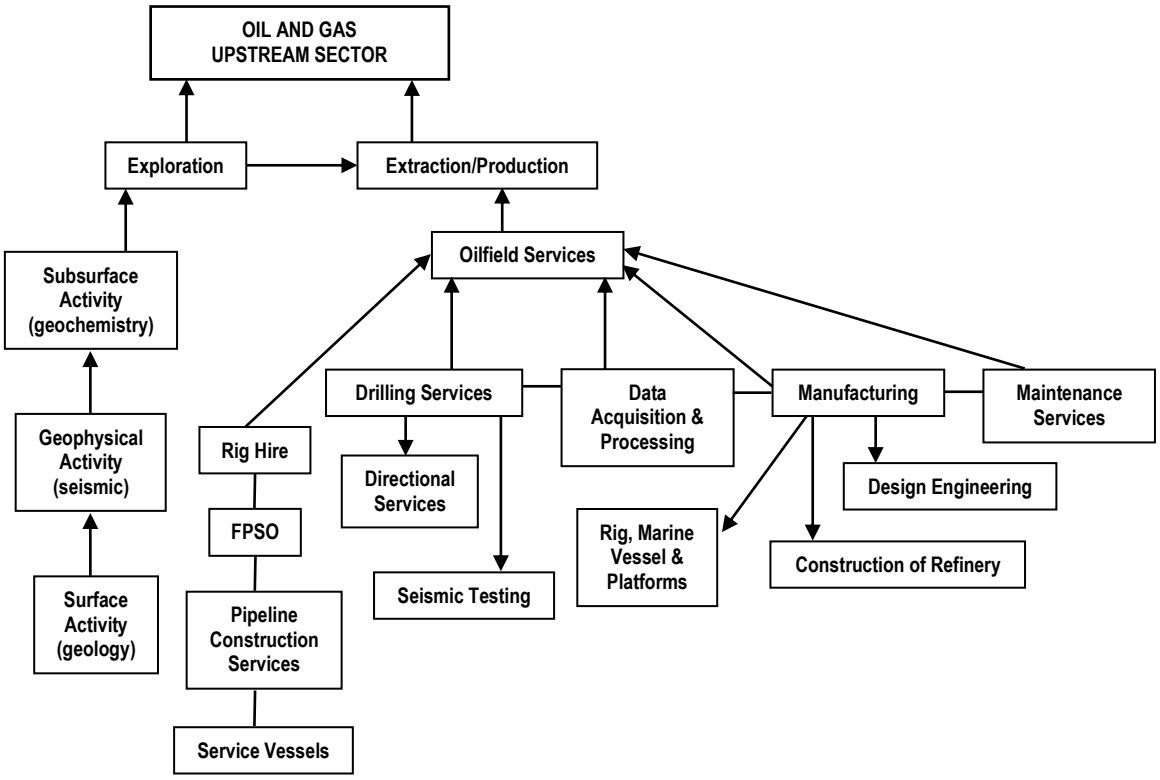

Figure 1.1: O&G upstream value chain
(adapted from Oyejide and Adewuyi, 2011)

The upstream O&G sector involves critical activities with greater benefit (Al-Naumani and Rossiter, 2015). These activities include: (i) exploration, i.e. surface activity, geophysical activity and subsurface activity; and (ii) development and production, i.e. drilling services, manufacturing of rigs, marine vessels and platforms, construction of the refinery, and design engineering of crude oil or natural gas (Oyejide and Adewuyi, 2011; Saad et al., 2014). The reason for focusing on the upstream O&G sector is due to the assumption that it faces complex environmental challenges and therefore more destructive to its host communities (Musa et al., 2013). Some evidence of environmental negative impacts from the upstream O&G sector is highlighted in Table 1.1. In addition, the following factors influenced the decision to focus on the upstream O&G sector:

i) Major negative impacts of O&G operations are associated with the upstream sector. For example, gas flaring, air pollution, water usage, contamination, and oil spillage occur during the exploration, drilling and production phases (Musa et al., 2013). Most incidents of the O&G sector with far-reaching consequences occur in the upstream sector. For instance, the April 10th, 2010 BP oil spill, which took the lives of several people, animals, and birds, occurred in the upstream sector (Black, 2010; Chan, 2011). This, therefore, makes the upstream sector a significant area of research.

ii) The upstream sector is where major financial capital projects with high value-added procurement activities occur (Ibrahim, 2008). Through the procurement channel, focal firms can instil sustainability measures down the supply chain, creating sustainability awareness among contractors, sub-contractors, suppliers, and sub-suppliers.

iii) The upstream sector, which is mainly made up of multinational and national O&G firms, can with their position, ability, and capacity drive sustainability measures down the supply chain. They can do this by incorporating sustainability measures into their organizational structure and involving contractors and suppliers in this direction.

iv) Given the financial and timescale constraints of this research, focusing on the upstream sector alone is considerably more feasible, as a study of the entire O&G sector would be unachievable bearing in mind the size and complexity of the sector.

Table 1.1: Some environmental impacts of operations in the upstream O&G sector

Stage	Effect	Subcategory
Exploration	Deforestation and disturbance of aquatic ecosystems	❖ Infectious diseases
Drilling and extraction	Chronic environmental degradation	❖ Discharges of hydrocarbons, water, and mud ❖ Increased concentrations of naturally occurring radioactive materials increasing the chances of occurrence of cancer
	Physical Fouling	❖ Reduction of fisheries ❖ Reduced air quality resulting from flaring and

		evaporation ❖ Soils contamination ❖ Morbidity and mortality of seabirds, marine mammals and sea turtles
	Habitat disruption	❖ Noise effects on animals ❖ Pipeline channelling through estuaries ❖ Artificial islands
	Livestock Destruction	❖
Transport	Oil Spills	❖ Destruction of farmland, terrestrial and coastal marine communities ❖ Contamination of groundwater ❖ Death of vegetation ❖ Disruption of the food chain
Combustion	Air pollution	❖ Particulates ❖ Ground level ozone
	Acid rain	❖ NOx, SOX ❖ Acidification of soil ❖ Eutrophication; aquatic and coastal marine
	Climate change	❖ Global warming and extreme weather events, with associated impacts on agriculture, infrastructure, and human health

Source: Oppong (2014, p. 99)

Furthermore, firms equipped with the financial capabilities of implementing sustainability measures predominantly dominate the upstream O&G sector (Yusuf et al., 2013). Although the entire O&G sector poses social, economic and environmental risks (Ambituuni et al. 2014), the researcher is hopeful that the exclusion of the mid and downstream sectors will not in any way thwart the research but provide a basis for future research. It is also argued that SP practices evolve from the upstream sector where strategic decisions of sustainability measures are made. This argument is clearly backed in the sustainability literature, which emphasizes the support of top management (Hasselbalch et al., 2015; McMurray et al., 2014; Walker and Brammer, 2009), who are based in most cases in upstream operations. Traditionally, best practices adopted at the top end of a supply chain do filter down the whole supply chain (Hassini et al., 2012). This assumption again supports the idea that best SP practices in the upstream sector will have a positive impact on the downstream sector.

1.3 Research Gaps

The role of the sustainability concept as it concerns SP is been captured differently, resulting in the development of different theories, frameworks, and techniques. This is attributed to the fact that the SP concept is still new (Hughes and Laryea, 2013). The notion that sustainability is about dealing with environmental issues alone also hinders the growth of SP in the O&G sector, which has mainly focused on reducing its environmental impact. Although previous studies have sign-posted firms' awareness of the TBL, an all-inclusive practice and study of the same remain scarce in this sector. To the best of the researcher's knowledge, no research has investigated SP practices within the Nigerian O&G sector. This gap will be addressed in this research. In addition, the drivers and barriers to SP implementation within this sector will be explored. This is crucial to help understand the underlining challenges adopters are experiencing within the sector. According to Delmonico et al. (2018), investigating the barriers to transformative initiatives require to solve important organizational issues is appropriate in challenging environments. The high level of informality in developing countries, which hinders the adoption of sustainability (Silvertre, 2015) can be considered as one of many challenges in the Nigerian O&G sector. The unavailability of clear and sufficient guidance for implementing SP practices, especially industry-specific ones, and a clear understanding of whether the implementation of SP practices can improve financial performances have all hindered the advancement of SP within this sector. These issues will also be addressed in this research because the researcher intends to collect empirical data to gain insights in this regard.

A preliminary review of the literature indicates some economic, social and environmental aspects of SP practices are been addressed within the sector. However, the underlining relationship of these practices for achieving corporate sustainability is still unknown. For example, the links between certain environmental or economic aspects of SP practices for achieving the TBL remains unknown. Although ISO 14001 is considered an important instrument implemented to help confront environmental issues within the TBL, its impact on environmental management performance has remained a subject of debate (Delmas and Montes-Sancho, 2010; Simpson and Sroufe, 2014; Zobel, 2016). Correspondingly, whereas it

is considered a key driver, the influence of ISO 14001, and other sustainability initiatives (e.g. UN Global Compact) on SP practices is also under-researched. These gaps will be addressed in this research.

As noted earlier, SP research that focuses on developing countries is scarce. Recent studies by Silvestre (2015) and Ahmad et al. (2016a; 2016b) signposts researchers' interest and commitment towards sustainability issues within the O&G sector. In addition to the social impact sustainability research generates (Delmonico et al., 2018; Walker et al. 2012), conducting this empirical study is critical for gaining context base knowledge and understanding of SP practices, especially from a developing country. In relation to the gaps noted in this research area, this study has developed explicit objectives targeted at investigating SP practices within the Nigerian O&G sector. This is necessary because SP practices implementation differs between regions, industries, firms and even individuals (Brammer and Walker, 2011; Islam et al., 2017b; Walker and Phillips, 2009). Besides, this study is imperative bearing in mind the environmental and social challenges facing the region under study, where efforts to implement innovative approaches are minimal and faced with diverse challenges (Musa et al., 2013; Omolola, 2013; Oyewobi et al., 2017).

1.4 Research expected contribution to knowledge

The O&G sector is a critical sector in the world, and especially to oil-producing countries. It contributes enormously to their economy and serves as a major source of income revenue (Amujo et al., 2015; Ingelson and Nwapi, 2015). This research is deemed paramount in order to foster ways in which corporate sustainability of firms within the O&G sector can be improved. This research aims to contribute to the knowledge of SP practices in several ways:

(i) It intends to investigate SP practices from a developing country perspective, which according to Walker et al. (2012), results from studies undertaken in developing country context would be informative.

(ii) Whereas aspects of SP practices, for example, corporate social responsibility (CSR) practices and supply chain sustainability practices, have been studied in the O&G sector previously (Ahmad et al., 2016a, 2016b; Silvestre, 2015; Yusuf et al., 2013),

research that exclusively investigates SP practices within the Nigerian O&G sector are scarce. This research, therefore, seeks to fill this gap, by exploring the current SP practices, drivers and barriers to SP implementation within the Nigerian O&G sector.

(iii) This research intends to contribute to the body of SP literature by exploring the underlying relationship between SP practices within the Nigerian O&G sector.

(iv) This research also seeks to ascertain the effect of sustainability initiatives, such as, ISO 14001 certification and UN Global Compact program in the implementation of SP practices, which has been a subject of debate within environmental management literature as noted above.

(v) Although previous works proposed several ways of improving the environmental and social impact of the Nigerian O&G sector (Ambituuni et al., 2014; Ingelson and Nwapi, 2015; Odukoya, 2006), this present research will examine the link between SP practices and firms' performances. The researcher hopes that the expected results will urge firms to embed SP practices in their businesses, to help improve corporate sustainability and firms' performances within the O&G sector.

(vi) Considering the scope of this research, it has the credible potential for publication in reputable academic journals, while also providing a foundation for further research. For example, the following have been published in both referred academic journal and conference proceedings:

- ✓ Ekiugbo, I. and Papanagnou, C. (2017), "The role of the procurement function in realizing sustainable development goals: an empirical study of an emerging economy's oil & gas sector", *European Journal of Sustainable Development*, 6, 3, 1-15.

- ✓ Ekiugbo, I. and Papanagnou, C. (2016), "The role of sustainable procurement in corporate sustainability: an empirical study of the oil and gas sector", in Proceedings of the 30th British Academic of Management (BAM) Annual Conference, Newcastle UK, Paper 618.

- ✓ Ekiugbo, I. (2016), "Developing sustainable procurement strategies for the oil and gas sector", Doctoral Symposium, Salford Business School, Manchester UK.

(vii) Finally, it is expected that results from this study will help executives, managers and personnel with procurement responsibilities to align the relevant SP practices that are crucial within the Nigerian O&G sector to their organisational goals.

Insights gained from this research would help extend an understanding of SP practices within the Nigerian O&G sector and the O&G sector in general. Specifically, this research would assist government agencies, practitioners, researchers and other industry stakeholders in identifying the key drivers and tools needed to implement SP practices across the sector. Furthermore, it is argued that understanding SP practices across developing economies will help firms, regulatory agencies, researchers and other stakeholders deal with sustainability challenges, such as climate change, inappropriate industrialization, poor health and safety standards, natural resource wastage and production and consumption patterns (Mansi, 2015; Walker and Brammer, 2009), while also highlighting the position of the sector under study.

1.5 Research aims and objectives

The aims of this research are *"to determine the underlying dimensions of SP practices and to empirically examine the relationships among SP practices, firms' performances, procurement sustainability strategy and initiatives within the Nigerian O&G sector"*. To achieve this, the following objectives are formulated:

1) To identify the current state, drivers, and barriers of SP practices in the Nigerian O&G sector;
2) To explore the underlying relationships among SP practices in the Nigerian O&G sector by grouping them into factors;
3) To examine whether sustainability initiatives such as ISO 14001 and UN Global Compact program drives firms to adopt SP practices;
4) To ascertain whether having clear SP strategy drives firms to adopt SP practices;

5) To study whether firms' corporate characteristics (size, turnover and time of applying SP), have an influence on the adoption of SP practices;
6) To establish whether SP practices in the Nigerian O&G sector impact on firms' performances.

1.6 Research questions

Considering the above, this research proposes to answer the following research questions:

1) What is the nature and extent of SP dimensions within the Nigerian O&G sector?
2) How important are SP dimensions to firms within the Nigerian O&G sector?
3) What are the drivers and barriers associated with the adoption of SP practices within the Nigerian O&G sector?
4) What are the underlying relationships among the SP practices explored in this research?
5) What are the relationships among adopted SP practices and sustainability initiatives, i.e. ISO 14001 certification and UN Global Compact?
6) What are the relationships among adopted SP practices and SP strategy?
7) Do the adoption and implementation of SP practices within the Nigerian O&G sector improve practising firms' performances?

1.7 Research methodology

In line with the above-listed aim and objectives, the methodology adopted for this research is mainly quantitative considering its positivist stance. This method is deemed more appropriate because this research is explanatory in nature. The emphasis of this research is not to gain in-depth knowledge of why firms engaged in SP practices, but to gain knowledge of the SP practices firms engaged in and understand causation effects, suggesting that the qualitative method is not appropriate (Bryman and Bell, 2007). Primary data were obtained from O&G firms in Nigeria using a questionnaire survey to investigate SP practices within the sector. This approach is quite popular in SP and sustainability research primarily because of the flexibility it offers researchers to reach out to wider populations especially in a sector like the O&G where respondents are not readily available (Kothari and Garg, 2014). However, prior to finalising the questions and launching the questionnaire, a pilot study was

undertaken with a focus group, which consisted of both academics and professional experts in the field, to pre-test the questionnaire, which was develop using the purchasing social responsibility (PSR) scales and those added by Walker and Brammer (2009) and Mansi (2015) and assess its cogency level before it was sent out.

To improve the response rate, the questionnaire was designed and structured in a clear manner to encourage the respondents. This is the only way of ensuring that a good response rate can be achieved to overcome a well-known disadvantage of survey questionnaires – low rates of return (Kothari and Garg, 2014). This method is particularly vital in a developing country context (Musa et al., 2013) where little attention is given to research and development improvements. Since the research emphasis is on the role of the procurement function in improving corporate sustainability and firms' overall performances, procurement professionals constitute the target respondents. These comprise procurement executives, procurement managers, procurement supervisors, procurement officers, and purchasing managers with managerial responsibilities and knowledge of their SP implementation. However, any procurement personnel with knowledge on procurement processes could also complete the questionnaires. Upon the collection of data, descriptive statistics, factor analysis and hierarchical multiple regression analysis were performed to analyze the data with the aid of the Statistical Package for the Social Sciences (SPSS).

1.8 Structure of the thesis

This thesis consists of six chapters structured as follows:

Chapter 1:

This is the introductory element of the thesis. It discusses the research background highlighting the key problems, its expected contribution to knowledge and practice, aims, objectives, research questions, and a brief discussion of the research methodology employed.

Chapter 2:

This chapter reviews the literature on the research phenomenon and other relevant concepts associated with it. For instances, it looks at supply chains and supply chain

management before examining the procurement concept and approaches within the O&G sector. It essentially reviews the literature concerning the potentials of the procurement function in realizing sustainability goals, the sustainability concept and SP practices as a means of achieving firms' corporate sustainability goals. It also reviewed the SP literature in relation to the Nigerian context especially with regards to the challenges and sustainability measures across the O&G sector. The gaps in the literature were further confirmed during this process and aided the development of the research conceptual framework.

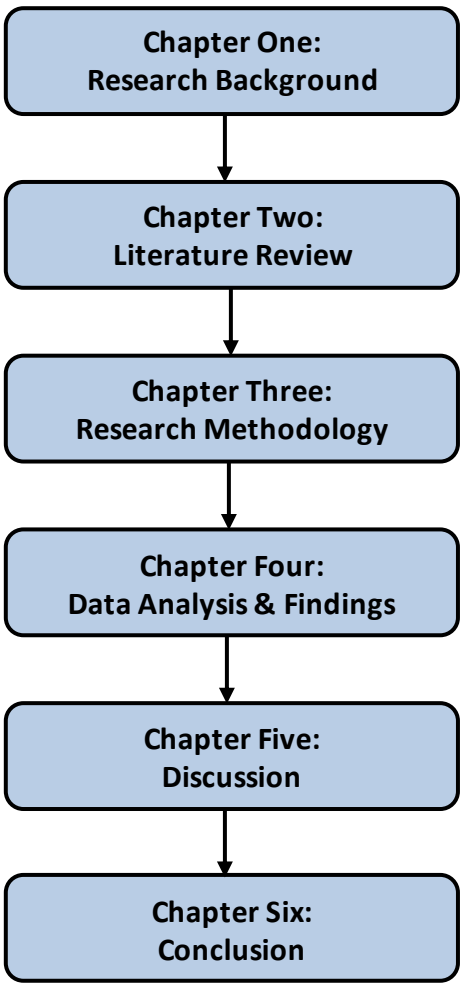

Figure 1.2: Structure of the Thesis
– Source: Author

Chapter 3:

This chapter discusses the different research methods and the methodology adopted in this research, as well as giving clear justifications for the research methods adopted.

Additionally, it discusses the research philosophy, research approach, research strategy, research design, the ethical approval process, the participants' recruitment procedure, the pilot study approach, the survey instrument, the data collection technique, and the data analysis technique.

Chapter 4:

This chapter reports the data analysis stage and research findings of the survey by questionnaires, analyzed with factor analysis and hierarchical multiple regression using SPSS. Prior to the statistical analysis, qualitative data are presented and discussed. In addition, cross-tabulation of the research variables are presented and discussed. The aim is to show the correlations among research variables, as well as present findings on cause and effect among the variables in this research.

Chapter 5:

This chapter presents a detail discussion of the key research findings in relation to the research and objectives. It links the research findings to the current literature by comparing and contrasting them in order to reach an informed conclusion.

Chapter 6:

This chapter concludes the research and presents a summary of the thesis. It synthesizes all the sections of this research and how the objectives have been met. It highlights the research contribution, limitations, and implications, as well as highlighting the opportunities for future research. Recommendations were also provided for both practitioners and policymakers.

1.9 Summary

Given the fact that sustainability issues demand drastic measures from regulatory agencies, firms, and stakeholders at all levels, efforts such as undertaking this kind of research will lead to a better understanding of sustainability challenges. This chapter presented background information of the research phenomenon, including the scope of the research. An overview analysis of the research context was carried out and the precise area of focus

identified. The gaps within the literature were identified, which led to the development of the research aim and objectives and how these would be realised. The challenges faced by both firms and stakeholders in the O&G sector explains the relevance and suitability of this empirical research, which is expected to provide a theoretical and practical contribution to the existing body of SP knowledge. Consequently, the importance of this research and the expected contribution to knowledge were explicitly highlighted in this chapter for clarity. The researcher's philosophical stance and the methodological approach for this research were also demonstrated in this chapter. Additionally, the structure of this research is shown in Figure 1.2 of this chapter to demonstrate the main steps taken.

The next chapter focuses on reviewing the literature on procurement as a concept and procurement approaches within the O&G sector and will attempt to link sustainability concept to traditional procurement, providing a substantive discussion on the role of the procurement function in achieving corporate sustainability. A detailed literature review on the main research phenomenon, SP practices, will be provided to address key research dilemma and issues relevant to this research. The chapter will also discuss the relevant theories that are broadly linked with SP practices, whilst assessing their suitability to this research.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter discusses the main issues concerned with the research phenomenon. Considering the interrelated nature of the research phenomenon, which spans across different functions and the objectives of this research, the chapter focus on reviewing only the key collections of literature with direct relevance. The chapter considers the concepts of supply chains and supply chain management in a broader context and the role of the procurement function in promoting sustainability practices with a focus on sustainable procurement (SP) practices. It defines and explains procurement and SP concepts, general drivers and barriers to SP implementation, and highlights on theories and tools for operationalising SP practices.

2.2 Supply chains and supply chain management

One cannot discuss procurement or its challenges, which forms part of the wider supply chain, without talking about supply chains or supply chain management. Supply chains (SC) and supply chain management (SCM) have both gained popularity over the last three decades because of the high cost of logistics relative to the total cost of production, growing competition between firms and supply chains, and other contributing factors such as globalisation and consumer awareness (Lambert and Cooper, 2000; Nikbakhsh, 2009). The SCM concept has been argued as unclear and incomprehensible (Croom et al., 2000). What is clear and understandable, however, is its ability to control a firm's operations, resources, information and funds to improve performance and maximise profitability (Hassini et al., 2012). There are a plethora of definitions for supply chains, but in Chopra and Meindl (2013, p. 13) they were defined thus:

> *"A supply chain consists of all stages involved, directly or indirectly, in fulfilling a customer request. The supply chain not only includes the manufacturer and suppliers, but also transporters, warehouses, retailers, and even customers themselves."*

The researcher's interest in this simple definition is the fact that the definition is very inclusive. The authors noted that the success or failure of a firm is tied to the planning, design and operation decisions of the SC. This explains the importance of SC, which comprises different firms all working together to fulfil the needs of the end customer (Tay et al., 2015). A network of the supply chain may involve manufacturers, suppliers, transporters, warehouses, retailers as well as customers and consumers (Chopra and Meindl, 2013). On the other hand, the SCM concept, which was first introduced in the early 1980s (Tay et al., 2015), is a process embarked on or adopted by firms to plan, control and manage materials, services, information and logistics activities within and outside their premises (Ahi and Searcy, 2013). Stock and Boyer (2009, p. 706) defined it with a holistic view as:

> *"The management of a network of relationships within a firm and between interdependent organizations and business units consisting of material suppliers, purchasing, production facilities, logistics, marketing, and related systems that facilitate the forward and reverse flow of materials, services, finances and information from the original producer to final customer with the benefits of adding value, maximizing profitability through efficiencies, and achieving customer satisfaction"*

Although there are numerous definitions of SCM (Biniazi et al., 2011; Chima, 2007; Cooper and Ellram, 1993; Flynn et al., 1990; Harland, 1996; Slack et al., 2007; Stadtler, 2008; Svensson, 2007), a conventional definition of SCM is scarce (Haake and Seuring, 2009). Whilst the above-quoted definition somewhat comprises nearly all the features of what SCM entails, i.e. *'information flow', 'coordination of activities', 'relationship management', 'customer satisfaction' etc.* (Ahi and Searcy, 2013), in taking a more refined view in defining SCM, Van Weele (2014) defined it as:

> *"The management of all activities, information, knowledge and financial resources associated with the flow and transformation of goods and services up from the raw materials suppliers, component suppliers and other suppliers in such a way that the expectations of the end-users of the company are met or surpassed"*

This definition emphasises the management of all the activities within the dyad supply chains and therefore deemed more appropriate and adopted for this research. This SCM process is aimed at, not just fulfilling the needs of the customers, but also exceeding their needs, which is often linked to cost. This suggests firms' effort in accomplishing the external needs of customers and stakeholders. Key activities of an SCM function from the extant literature are purchasing, production, distribution and economic (Esfahbodi et al., 2016). Although SCM literature has taken broader views and dimensions over the years, its primary aim is to manage the flows of information, materials and services through the development and coordination of strategic relationships to meet the needs of both firms and stakeholders (Ahi and Searcy, 2013). Following environmental and social concerns, manufacturing and production processes have shifted from a *linear economy* to that which reflect the *circular economy*. This shift has led to new approaches to the manufacturing and production process to help mitigate environmental challenges.

Notably, there are contemporary studies looking at how sustainability measures can be integrated within SC, which have inevitably triggered some new concepts within the SCM literature, e.g. green supply chain management (GSCM) and sustainable supply chain management (SSCM) (Ahi and Searcy, 2015; Tay et al., 2015). In its simplest form, GSCM is refer to as the management of environmental issues within the supply chain (Srivastava, 2007; Zhu and Sarkis, 2004), while SSCM is referred to as the management of environmental, social and economic issues within the supply chain (Crater and Rogers, 2008; Nikbakhsh, 2009; Walker and Jones, 2012). Concentrating on single activities that are integral to SCM, similar concepts e.g. sustainable procurement, sustainable production and sustainable distribution were also developed. The focus of this research is on the procurement function, which forms part of the larger SC. To manage this crucial subset of the SC efficiently and effectively, the integration of sustainability ideologies has become necessary as this move can lead to firm's financial, social and environmental performances, as well as the achievement of sustainable development objectives (Islam et al., 2017a; Kalubanga, 2012; Walker et al., 2008).

2.3 Defining the procurement concept

Following the above theoretical analysis on SC and SCM and their link to the research phenomenon, the procurement concept, which is the focus of this research, will be next. The stance of this current research on procurement as a function has been highlighted in the introduction chapter. The procurement concept will, however, be explored further in this literature review chapter. Procurement is a general term covering a wide range of strategic and tactical activities within a firm (Brewer et al., 2014). Although the procurement function was considered only as a support activity in the past (Cox et al., 2005; Kaufmann and Carter, 2004; Porter 1985), this perception has changed over time. Organisations globally now see the procurement function as an essential function with strategic importance for achieving organisational goals (Allal-Cherif and Maira, 2011; Grant et al., 2015; Paulraj et al., 2006; Tassabehji and Moorhouse, 2008). Like many other concepts, procurement is interchangeably used with purchasing (Van Weele, 2014).

It is argued that procurement and purchasing are two separate concepts because procurement is more strategically focused, essentially covering all activities of procuring goods and services including the '*purchasing activities*'. Whereas purchasing is barely considered as the activities of the buying process only (Grant et al., 2015) and is broadly defined as the act of obtaining goods and services (Nijaki and Worrel, 2012). In Kalubanga (2012), it is referred to as the acquisition of goods, works and services from the supplier, which can be an individual or a firm.

According to the United States of America Defense Acquisition University (2009) cited in Akinola et al. (2013, p. 31), procurement was defined as *"the acquisition of appropriate goods and services at the best possible cost of ownership to meet the needs of the purchaser in terms of quality and quantity, time and location"*. This definition also correlates with that of Burt and Pinkerton (1996) where procurement was defined as the process of *"deciding what, when, and how much to purchase; the act of purchasing it; and the process of ensuring that what is required is received on time, in the quantity and quality specified"*. Again, like other concepts, the definition of procurement varies in the literature (Akinola et al., 2013; Kalubanga, 2012). Nevertheless, one similarity drawn from the above definitions is that

procurement is the act of acquiring goods, works, expertise and services (including any activities in the process of such acquisition) by a procuring firm. This process includes sourcing, contracting, monitoring, evaluation and expediting (Kalubanga, 2012), while the sourcing process on its own involves the identification and assessment of needs and the supplier selection process.

In broader terms, the activities of the procurement function include the identification of requirements, determining specifications, sourcing for suitable suppliers, negotiating contracts, receiving products and services, carrying out quality inspections, storing and managing inventory, contract management, and inbound distribution of goods and services (Nikbakhsh, 2009). As noted earlier on, the procurement function forms part of the wider SCM activities, which also include production, distribution and financial aspects. Having clarified the procurement concept, and what it involves, the next section will look at general procurement trends within the O&G sector. This is important to gain theoretical underpinning of the developments seen by the procurement function within the O&G sector and to give the researcher a foundation on which to build his conceptual framework.

2.4 Procurement trends in the O&G sector

The complexity in O&G projects is characterised by a high degree of uncertainty, engineering competence, technological competence, technical competence, the time scale and the different numbers of stakeholders, i.e. suppliers, contractors, consultants and clients. This has warranted operators in the O&G sector to take a more systematic approach in managing their supply chains to help cope with these challenges (Caniëls et al., 2012; Olsen et al., 2005; Saad et al., 2014). This approach is expected to mitigate issues that may arise during a project's execution. In addition, due to the low oil prices and the high exploration and production costs witnessed in the sector, there have been growing needs to cut costs across the sector (Crabtree et al., 1997; George et al., 2016). The management of the procurement function, which was formerly seen as irrelevant, is now considered a key influence in the sector, as the success or failure of projects now depends on how much attention is given to the procurement function (Mohammad, 2008; Saad et al., 2014). This awareness contributed to the changes witnessed in the sector as the parties involved a trend towards more

advanced procurement methods that consider not only economic benefits but also those which look at risk and profit sharing among stakeholders.

The above change, where it exists, remains inadequate and is merely a replication of other sectors' procurement approaches typically with no link to sustainability practices (Saad et al., 2014). This inadequacy is linked to the small numbers of operators and contractors within the O&G sector (Pedwell et al., 1998). In addition, the exploration and production of O&G in developing countries can be very perilous, especially in the country under study where there have been repeated occurrences of unstable governments. This has resulted in changes in regulations, taxation, and sometimes licence fees; insecurity, i.e. militancy and terrorism; conflicts between operators and host communities; oil theft; oil bunkering; pipelines vandalisation; other related issues that make the sector even more challenging (Anifowose et al., 2012; Onuoha, 2008).

The procurement function as noted is a priceless function in achieving organisational goals, which therefore means that firms must adopt the right procurement methods and approaches if they are to succeed. Although the O&G sector is one of the major revenue creators especially in oil-producing countries (George et al., 2016), research work that looks into procurement methods and practices within this sector has remained scarce (Mohammad, 2008). The above situation as opined by Pedwell et al. (1998) is because of the small numbers of operators and contractors, which gave rise to the formation of both formal and informal relationships by the different parties involved. They noted further that the dearth of common procurement procedures in the O&G sector is caused by the different procurement methods and practices in existence across countries and regions, which makes it difficult for operators to choose an appropriate procurement method to adopt (Mohammad, 2008).

The fact that the O&G sector relies heavily on experts from other disciplines, e.g. information technology (IT) experts, architects, drillers, welders and even caterers, further compounds the challenges faced in making procurement decisions. Having said this, there have been notable achievements in terms of technology discovery and other initiatives to

reduce costs within the O&G sector (George et al. 2016; Panopoulou, 2001). One such initiative is 'Cost Reduction In the New Era' (CRINE) in the UK proposed in June 1992 mainly to look at more viable ways in which operators and contractors together with subcontractors and suppliers in the North Sea can reduce operating and capital costs in O&G projects (Crabtree et al., 1997; Franklin, 2005). In addition to these efforts, the development and adoption of innovative procurement strategies can inevitably lead to valuable cost reduction and competitive advantage (Puschmann and Alt, 2005). This is evidence in the O&G sector adoption of electronic invoicing and procurement technology to speed up and streamline the procurement process (Haines, 2004). The adoption of such initiatives is significant in a sector dominated by both internal and external factors that influence O&G prices on a daily basis.

2.5 Procurement approaches in the O&G sector

The above discussion signposts the existence of different procurement approaches within the O&G sector. For this reason, this section is gear towards highlighting the different procurement approaches in the O&G sector. Like other disciplines or sectors, development evolves over time. The procurement practices in the O&G sector is no different, as it has witnessed several changes beginning with the discovery of crude oil. As already noted above, a few major players dominate the O&G sector, and as a result, competition is tougher, and procurement practices in country *'a'* for instance may be different from those in country *'b'* and likewise between regions in a specific country. These facts have contributed to the non-existence of standard procurement methods within the O&G sector. However, there are both traditional and innovative procurement approaches as observed in Crabtree et al. (1997), Huse (2002), Mohammad (2008) and Pedwell et al. (1998), which are hereby highlighted in Table 2.1.

Table 2.1: Traditional and innovative procurement methods

Traditional procurement approaches	Innovative procurement approaches
↓ Lump-sum	↓ Partnering/Alliancing/Joint venture
↓ Unit-price	↓ Performance-based
↓ Cost-plus or cost reimbursement	↓ Supply chain management
↓ Engineering, procurement and construction (EPC)/Turnkey	↓ Risk management
↓ Service type	↓ Incentive schemes
	↓ Leasing
	↓ Contract to produce

2.5.1 Traditional procurement approach

According to Cartlidge (2004), three drivers originally determine the adoption of a procurement method in the traditional approaches i.e. time, cost and quality. The adoption is said to depend on the relevance placed on these three drivers by firms, where a decision had to be made by such firms to choose one from the three drivers, as all three drivers cannot be achieved simultaneously. The traditional procurement approaches are examined below.

2.5.1.1 Lump-sum approach

The lump-sum approach according to Broome (2002) is an approach where contracts are broken into smaller segments and lump sums are paid for each segment. The lump-sum approach focuses on cost, which fosters price competition. Operators base their selection and award of contracts on cost if a contractor meets the minimum prerequisites on the tenders. In a relationship based on price, parties are involved in a competition for their respective gains, which is to manage resources to make profits, giving less or minimal attention to the project goals. This kind of situation in most cases leads to project delays and even the delivery of substandard projects. It has also been noted that contractors suffered huge financial losses under this procurement approach due to its failings (Franklin, 2005). Although this approach comes with some benefits, i.e. it is stress-free and cheap to use (Huse, 2002), it also has its disadvantages as highlighted in Gransberg and Ellicot (1997) and reproduced in Table 2.2.

Table 2.2: Benefits and pitfalls of lump-sum/unit-price procurement methods

Benefits	Pitfalls
✓ It is easy, but time-wasting, solicitation preparation and evaluation process ✓ It is a simple selection process whereby the lowest responsive, responsible offer wins ✓ It is hard to protest – protesters must show a flawed process since the low bidder is readily apparent	× Selection is based solely on cost, with no consideration of quality or even timeliness × It assumes perfect (unambiguous) plans and specifications × It assumes that the minimum requirements meet the customer's needs and that exceeding minimum standards does not enhance the project. × A contractor buying into the contract with a low offer could be selected

2.5.1.2 Unit-price approach

The unit price approach, also often referred to as the bill of quantity, is a method in which the cost of a project is calculated based on the volume of work carried out (Huse, 2002). The cost is however determined by each unit of work quantity needed to carry out a specific task, i.e. cost of materials and labour that has been incorporated in a bill of quantity already included in the contract at the initial stage. While this approach is seen as a method of transferring the risk of changes in the cost of a project to the contractor it also places the risk of the number of units utilised on the operator. Like the lump-sum approach, the unit-price approach also focusses on cost, which promotes price competition although pricing tools can be adapted to adjust pricing in a way that is beneficial to both parties. For example, a pricing tool should allow for the adjustment of price due to changes in labour or material cost which are outside a contractor's control. With this pricing mechanism, the risk of changes in cost is automatically shifted from the contractor to the operator. This approach is said to be very popular, especially in construction agreements where the amount of work needed for a construction project is not certain at the initial stage of entering into the agreement. In Huse (2002), firms were urged to act with caution when adopting this approach because it is prone to price manipulation.

2.5.1.3 Cost-plus or cost reimbursement approach

In the cost-plus approach, the contractor is reimbursed by the operator for any cost incurred as a result of the project based on actual cost of materials, machinery and labour and also paid a fixed margin of profit (Cartlidge, 2004). This fixed margin is flexible because it can be fixed, changeable or even determined as a percentage of the actual project cost (Huse, 2002). The above practice does not provide any incentive to the contractor in terms of economic health or speedy delivery of the project but instead offers contractors the opportunity to increase costs because by so doing their profits will increase. To solve this incentive problem, it has been suggested that operators could add an incentive mechanism, such as a bonus scheme, as part of the pricing provision of the contract for early completion of the project (Huse, 2002; Mohammad, 2007). This approach is mostly used when there is trust between the parties involved in the contract.

2.5.1.4 Engineering, procurement and construction (EPC) approach

The EPC or turnkey approach is similar to the lump-sum approach as contractors are paid only the initially agreed sum for the project irrespective of whether the contractor incurred more cost during the project. The responsibility of the project from the design stage to the construction stage rests on the contractor who delivers the completed project made to specification to the operator at the end (Huse, 2002). This, therefore, means that the contractor must deliver the project in accordance with the specification agreed upon. The existence of high risk and uncertainty in projects with the use of the EPC approach has made its usage questionable (Zhu et al., 2014). The risk involved in this sort of arrangement made the likes of Haliburton Energy rethink the way it does business by announcing that it would not pursue EPC contracts anymore (Mohammad, 2007). Stressing the problems associated with EPC projects Yeo and Ning (2002) noted interdependence of activities, phase overlaps, work fragmentation, complex organisational structure, uncertainty and inaccurate prediction of desired outcomes as the challenges faced. In Huse (2002), it has been noted that the use of a turnkey approach in the US construction industry increased to a record $69 billion in the mid-1990s from $18 billion recorded in the mid-1980s. While the above problems were pertinent, the use of EPC, however, remained popular over a long period.

2.5.1.5 Service type approach

Lastly, we have the service type, which acts as a support function to the other procurement methods. Due to the complexity of oil and gas projects, it is practicable for operators, contractors or suppliers to enter into more agreements with third-party firms, i.e. IT firms, drilling firms, fabrication firms and even catering firms. The services of third-party firms are essential for the smooth operation and ultimate completion of projects. For example, a catering firm provides food supplies to project fields, while an IT firm provides experts to help with IT challenges. Operators and contractors can use this approach, which is often base on competitive bidding or tendering, to minimise the cost of service required while driving that of the third-party firm up. This results in a low standard of service from the third-party firm in an attempt to make a profit from the small margin offered by the operator or contractor. This sort of approach also attracts criticism as third-party firms struggle to survive due to the squeeze in contract competition by operators or contractors.

In summary, the use of traditional methods of procurement no doubt has played its part in advancing the O&G sector. However, these forms of procurement have led to a series of criticisms as to their capabilities and who benefits from them (Allal-Chérif and Maira, 2011; Franklin, 2005; Mohammad, 2008). Contractors, suppliers, and third-party firms expressed their grief about the negative results that these sorts of procurement methods have on their businesses, as they bear all the risk in construction projects between them and the major operators. Meanwhile, operators are busy reporting increases in their net incomes (Franklin, 2005). This situation can simply lead to one conclusion, which is that the traditional methods of procurement are only favourable to the operators. Mohammad (2008) further supports this assumption where it is observed that operators still opt for traditional methods even though they are aware that alliances and collaborating methods could be more appropriate in some situations.

2.5.2 Innovative procurement approach

To tackle the challenges faced by the O&G sector some innovative approaches have emerged. This advancement is specifically important for the O&G sector that is currently suffering an economic crunch due to the plummeting oil prices and the ever-rising cost of

operation and maintenance. These innovative approaches as highlighted above came into existence because of the dynamic business environment, each developed as a mitigation factor to try to overcome business challenges and to strengthen the firms' internal relations and those of buyer-supplier.

2.5.2.1 The partnering/alliancing/joint venture

Partnering is a contractual relationship where the parties involved work together to achieve a specific goal. In this sort of relationship, exchange of information, trust and honesty are the norms as the parties involve work to achieve a win-win situation. Though a common definition of partnering is scarce, the concept aims to maximise the effectiveness of parties involved to achieve specific business objectives (Bygballe et al., 2010). There are however two types of partnering, project and strategic partnering. Strategic partnering is seen as a long-term focus while project partnering is developed for specific project aims but often leads to long-term strategic partnering. It is therefore assumed that the use of partnering for improving the buyer-contractor relationship ultimately leads to improved project performance. The study of Larson (1995) rightly supports this assumption as the study result reveals that projects managed under a traditional approach achieved lesser results compared to those that utilised partnering.

In Sepehri (2013) the use of close partnership relationships within the oil and gas sector was established. However, the failure to create trust between parties involved in partnership relationships has been observed to be a potential snag. Other drawbacks also include a dearth of understanding of partners' core values and their significance, the dearth of vision for a long-term relationship together with the dearth of commitment to support them, and the imprecise positions, responsibilities, and alignment to common objectives (Mohammad, 2007). Nonetheless, it is emphasised that partnering is significant in driving cooperation between buyer-contactors which can hitherto lead to improving project performance. According to Wood and Ellis (2005), partnering is the most efficient means of improving project performance.

2.5.2.2 Supply chain management (SCM)

SCM concept has been discussed earlier on, where the challenges associated with its definition was highlighted (Haake and Seuring, 2009). However, its main objective is to integrate activities within the supply chain through collaborative relationships between the parties involved in order to improve project performance (Power, 2005). Although the integration process could be very expensive and takes a long time to materialise, it is argued that this challenge should not deter its implementation (Bygballe et al., 2010). The SCM approach emphasised on the creation of a close relationship with suppliers and suppliers' suppliers because they are an integral part of the supply chain providing vital inputs into the process that could improve productivity and innovation. The essences of SCM according to Yeo and Ning (2002) are:

1) To enhance trust between supply chain partners;
2) To re-engineer the business process to build a networked enterprise model;
3) To employ IT/IS to fast-track information flow in both intra and inter organisations.

They also identified the drivers of SCM as (1) real-time information sharing; (2) coordinate the procurement process in the entire chain; (3) display of collaborative attitude between chain partners. The three drivers highlighted above no doubt can foster a close relationship. For instance, by frequently sharing information supply chain partners would be inclined to engage in activities. Also, the proper coordination and allocation of responsibilities within the supply chain will create an alignment of a common objective, while the third driver will automatically be achieved once the first and second drivers are achieved.

2.5.2.3 Performance-based

In a performance-based relationship, the client chooses a contractor based on previous performance, eliminating the tendering and award process. Its focus is the final output of the project and not how the project is executed (Gruneberg et al., 2007; Meacham et al., 2005). Straub (2009) noted that in this type of approach the process phase, which includes specification, selection, contracting, work and supervision of the project, becomes inexpensive while the after-care phase remains more expensive as performance measurements are done periodically. He observed further that with a performance-based approach, direct and indirect costs are reduced. For example, through experience gained by

the parties involved in the project, through savings on manpower and materials, and other incidental costs. The prerequisites for achieving cost reduction, however, are long-term involvement and freedom afforded the contractor, which could lead to opportunities such as product and maintenance process improvement (Straub, 2009). Another notable benefit associated with this approach is that it encourages contractors always to improve. The use of a performance-based approach is fully endorsed in the literature (Kashiwagi et al., 2003; Bramwell, 2003). Having said this, it is observed that performance-based contracting increasingly shifts project risks from the client to the contractor (Gruneberg et al., 2007).

2.5.2.4 Risk management

Risk management is inevitably one of the approaches from which the O&G sector can benefit. In a sector such as this, characterised with complex construction and engineering environments, growing costs, business dynamics and huge uncertainties where the traditional procurement approaches have appeared to be incapable and unsuitable, the use of a risk management approach cannot be overemphasised. From the organisational perspective, the risk is seen as the effect of uncertainty (which could be either positive or negative) in objectives while risk management is seen as the coordinated activities to direct and control risk (Almeida et al., 2010). The primary purpose of risk management is to identify and allocate risk (Gruneberg et al., 2007). The risk management process involves four stages according to Masterman (2002). These stages include identifying risk, evaluating the risk, developing measures to reduce risk, implementing measures to reduce the likelihood or impact of the risk occurring. Therefore, considering the high risk associated with construction projects, the use of a risk management approach is priceless in managing and controlling inherent risk as a result of either human errors or natural catastrophes (Almeida et al., 2010).

2.5.2.5 Incentive schemes

Broome (2002) described incentive as a technique used to encourage or motivate an individual or firm in order to get the best out of them to achieve specific goals. This can be in the monetary form or other forms of incentive like concession depending on the project that could help improve performance. The use of an incentive scheme is to align contractors'

motivations with those of the clients. Broome (2002) also noted that incentive schemes, such as performance incentive, process incentive, gatepost incentive and graduated incentive, can all be integrated into the procurement methods. Also noted is the use of positive and negative incentives, where negative incentives are seen to have 'none' to 'some' impact, and positive incentives seen to have 'some' to 'much' impact upon performance. Although explicit examples of positive and negative incentives were not stated in Broome (2002), positive incentives focus on more positive inspired goals where parties work cooperatively to achieve project objectives rather than transferring responsibility. While the use of only positive incentives is strongly advised against, negative incentives on their own result in negative performance. The best approach is to combine both negative and positive incentives to achieve the best performance.

2.5.2.6 Leasing

The leasing approach according to Grenadier (1995) offers a procedure for the separation of ownership from use, which involves an asset or machinery acquisition for use over a precise period of time. This approach gives contractors the opportunity to facilitate projects, i.e. the lease of fabrication yards, the installation of fleets and the hiring of operational staff (Mohammad, 2007). Though the leasing approach is considered beneficial, there are also some drawbacks associated with it (Grenadier, 1995). For instance, while the leasing approach is profitable for small fields with short periods its use is not profitable for larger fields with longer periods.

2.5.2.7 Contract to produce

Moving from the partnering, alliancing and leasing approaches, the contract to produce is tipped as the next approach. This according to Mohammad (2007) involves a life-of-field approach where contractors are obligated to improve their capabilities in order to develop and operate O&G fields and not just to service them. This approach was also seen as the future direction for procurement strategies in the O&G sector, as firms are now developing expertise and capabilities to help them achieve the contract to produce procurement strategies. This approach will see contractors as virtual oil companies while the O&G operators will just be responsible for the discovery and selling O&G products. Although this

is still a work in progress, the contract to produce approach remains prevalent in the O&G sector (ALCOA, 2012; Anonymous, 2012).

From the above sub-sections, it is observed that the changing role of the procurement function together with the proposed benefits associated with the use of innovative procurement approaches has made their usage popular (Masterman, 2002). The high cost of operation and maintenance of exploration and production facilities in the O&G sector and the plummeting oil price, to some extent, justify the attitudes of operators. However, it is imperative for operators to look for more innovative procurement approaches of leveraging cost to overcome these challenges and not traditional methods that mostly deal with just capital costs and fixed prices (Mohammad, 2007). Mohammad (2007) noted further that traditional procurement approaches are not suitable for, and capable of dealing with, the challenges in the O&G sector. Furthermore, Yeo and Ning (2002) emphasised the use of close cooperation and partnership relationships between procurement and construction functions to achieve good performance. This was also the view of Allal-Chérif and Maira (2011), who opined that traditional approaches have limitations, and to strengthen internal processes and buyer-supplier relations, new innovative procurement approaches are indispensable.

As firms become more involved in the management process of their projects, so also does the introduction of various procurement methods increase, to help meet clients' needs and achieve economic benefits. One of these methods is the *e-procurement* strategy used to gain cost efficiency and improve lead times. This approach is also prevalent within the O&G sector (Haines, 2004; Poruban, 2002). As observed in Cartlidge (2004), the implementation of e-procurement best practices leads to a potential return on investment. E-procurement, which is enabled by technology, is also endorsed as a known source of gaining a cost advantage over competitors by aligning internal processes with co-operating objectives (Haines, 2004; Puschmann and Alt, 2005). For example, with e-procurement, some cost elements are reduced, i.e. communication costs and internal processes, because these can be improved through an integrated system.

The use of e-procurement systems leads to process and procurement cost efficiencies and is very flexible and inexpensive to implement when compared to other integrated systems such as enterprise resource planning (ERP) (Puschmann and Alt, 2005). It is significant to note that this process works effectively if operators and contractors or suppliers are directly integrated. Another important aspect is that adopters need to provide appropriate tools for the IT systems and training for its personnel to achieve optimum efficiency. Furthermore, in Puschmann and Alt (2005, p. 123) some benefits of e-procurement systems were noted. For example, it is stated that the use of e-procurement systems *"enables companies to decentralize operational procurement processes and centralize strategic procurement processes as a result of the higher supply chain transparency provided by e-procurement systems"*.

However, in a recent study of 90 O&G firms, 47% of the firms noted that measuring return on investment for collaboration is their major challenge (Oil & Gas Journal, 2016). Although this challenge questioned the benefits of going into collaborative relationships, this approach, the researcher argues, remains a viable opportunity to drive down operational costs by utilising extra capabilities and flexibilities that such relationships offer. Nevertheless, caution must be exercised because not all relationships are worth committing to – that is to say, collaboration cannot be the only suitable approach for all business relationships. This said, firms must tailor their needs accordingly in building business relationships.

In summary, the researcher states that an examination of the different procurement approaches use within this sector is important in this research to offer an understanding of the level of cooperation and integration between operators, servicing firms, contractors and suppliers within the sector. This is particularly necessary since the sustainability literature accentuates on the need for collaboration (Esfahbodi et al., 2016; Vachon and Klassen, 2008; Veleva et al., 2003; Walker and Brammer, 2012; Walker and Jones, 2012). Although the above analysis shows that procurement relationships within the O&G sector vary, it also shows that collaborative relationships exist. On this note, the next section will examine the sustainability concept and its relationship with the procurement function.

2.6 Sustainability

Sustainability concept has been defined along the social equity, environmental protection and economic development spectrum (Orji, 2013; Mebratu, 1998; Nijaki and Worrel, 2012). Although the definition of sustainability varies within the literature, the role of sustainability in developing a universal view with respect to people, society and the planet's future has made it very influential. While it is common to find different definitions of a concept during its early stage of adoption (Gladwin et al., 1995; Kuhn, 1996), the array of definitions has been considered a significant challenge for understanding the concept of sustainability (Carter and Rogers, 2008). In addition, there is little discussion within the literature highlighting the difference between sustainable development and sustainability. Whilst both concepts are closely linked and used interchangeably, sustainable development is an act towards sustainability. Sustainability is, therefore, the long-term goal of sustainable development and other similar initiatives.

It is clear from the literature that equal attention must be given to the environmental, economic and social aspects of sustainability (Gimenez et al., 2012; White, 2009). To this end, the sustainability concept not only emphasises on environmental improvement but also an improvement in the quality of human life, socio-economic development and the preservation of natural resources (Orji, 2013). This broader view considers issues relating to the TBL that firms, governments and other organisations encounter. Sustainability concept has triggered thousands of initiatives on a local, national and global scale as governments, international agencies and business organisations seek to incorporate sustainability values into their policy documents (Giunipero et al., 2012; Mebratu, 1998). These moves indicate that despite the challenges associated with the sustainability concept, application of sustainability values and practices have progressively risen across different industries and sectors (Berns et al., 2009; Yusuf et al., 2013).

Several principles reflecting the TBL have been theorised to help with the implementation of sustainability. For instance, *environmental sustainability, economic sustainability and social sustainability*. These three aspects are discussed further below:

2.6.1 Environmental sustainability

Environmental sustainability focuses mainly on removing or reducing negative environmental impacts on society has led to the birth of terms like *'renewable resources', 'resources minimisation', 'source reduction', 'eco-design', 'cleaner production', 'pollution control', 'recycling', 'life cycle assessment', 'reuse', 'repair'* (Glavic and Lukman, 2007). As envisioned in the definition of sustainability, the environmental aspect strives to maintain natural resources by protecting sources of raw materials needed for this generation and the future generation (Yusuf et al., 2013). *Environmental sustainability* also seeks to mitigate issues of global warming and climate change, which if not dealt with, could lead to disturbance of economic activities and food scarcity (Bracho, 2000).

2.6.2 Economic sustainability

Economic sustainability foci more on realising economic benefits and at the same time realising environmental and social goals (Carter and Rogers, 2008). Economic sustainability promotes terms such as '*environmental accounting', 'eco-efficiency', 'ethical investments', 'ethical practices', 'fair-trade practices'* and other metrics to foster economic development (Glavic and Lukman, 2007). It means encouraging the utilisation of resources in an efficient and effective manner to yield long-term benefits as well as reducing the negative impacts of resource misuse (Abubakar, 2014; Yusuf et al., 2013). In addition, *economic sustainability* denotes the avoidance of acts that could cause disruption and instability (Costanza and Patten, 1995).

2.6.3 Social sustainability

Lastly, *Social sustainability* focuses on the improvement of peoples' quality of life, but devoid of environmental damages and excessive use of natural resources. Terms like *'social responsibility', 'health and safety', 'diversity', 'philanthropy', 'reporting', 'buy local'* amongst others have emanated from the s*ocial sustainability* purview (Glavic and Lukman, 2007). *Social sustainability* emphasises the wellbeing of both internal and external stakeholders of firms by promoting responsible business practices that demonstrate good labour conditions, health and safety, diversity, equal opportunity, ethical behaviour and contribute to local and

national growth amongst others (Carter and Easton, 2011; Gimenez et al., 2012; Zhu et al., 2013).

As earlier noted, the sustainability literature emphasises that firms should implement measures of the TBL simultaneously to help mitigate sustainability issues (Gimenez et al., 2012). This has become important as stakeholders continue to pressure firms to be more responsible and accountable in their operations (Carter and Easton, 2011). Increased environmental and societal challenges encountered by firms and their suppliers also mean radical measures, which look beyond traditional business models, must be considered (Roman, 2017). For instance, environmental challenges like air pollution, water pollution, GHG emissions and solid waste are considered major contributors to global warming and climate change issues. Also, resource depletion resulting from higher production and consumption rates link to increase in population, also means care must be taken in the use of natural resources to avoid scarcity (Shuen et al., 2014; Srivastava, 2007). Furthermore, increasing criticism and demand for more sustainable and environmentally friendly goods by media institutions, governments and consumers who have become more conversant with global environmental challenges have all contributed to the call for a paradigm shift.

In specific, industrial production and manufacturing firms together with their suppliers must indulge in practices that have less or no negative impact on the environment, society and natural resources. This is because the industrial sector contributes immensely to the negative environmental, societal and resource depletion challenges the world is presently going through (Esfahbodi, 2016; Yusuf et al., 2013). In response to calls for new approaches, industrial sector firms and their suppliers have taken different steps to integrate sustainability practices into their operations (Azadnia et al., 2015; Harms et al., 2013; Hoejmose et al., 2013; Holt and Ghobadian, 2009; McMurray et al., 2014; Stead and Stead, 1995; Tan et al., 2015; Walker and Jones, 2012; Yusuf et al., 2013). These efforts have brought about new approaches that not only consider firms' economic performance but also their environmental and social performances. Concepts such as sustainable procurement (SP), sustainable supply chain management (SSCM) and other related concepts as earlier highlighted in this chapter have been developed (Ahi and Searcy, 2015; Tay et al., 2015).

A crucial concept for achieving sustainability according to Walker and Brammer (2009) is SP. SP forms part of the wider SSCM concept (Ahi and Searcy, 2013; Ahmad et al., 2016a; Esfahbodi, 2016; Roman, 2017; Silvestre, 2015). This opinion is in line with the extant literature, which signpost the implementation of sustainability values through strategic assimilation of procurement policies and practices (Aktin and Gergin, 2016; Giunipero et al., 2012; Grandia, 2016; Islam et al., 2017b; McMurray et al., 2014; Vachon and Klassen, 2006; Zsidisin and Hendrick, 1998). Carter and Easton (2011) also observe that firms can either have a positive or negative impact on their environmental and social performances through supplier selection and development processes, as well as location decisions and packaging choices. Reinforcement this view, Aktin and Gergin (2016, p. 769) stated thus: *"In order to accomplish higher corporate sustainability, companies need to work with sustainable suppliers, and/or co-operate with them"*. The strong submissions that SP practices can lead to corporate sustainability accelerated the relationship between sustainability and the procurement function that created the SP concept. The next section will expand on the critical role of the procurement function and its suitability to deliver sustainability goals.

2.7 Potentials of the procurement function

The accepted role of the procurement function, which has evolved in recent times and is, still evolving, makes its strategic significance to businesses priceless (Grant et al., 2015; Paulraj et al., 2006; Tassabehji and Moorhouse, 2008). This has helped to instigate this research in the present context - an area that lacks SP research because the procurement function is argued as a genuine channel that can help managers promote sustainability practices (Mena et al., 2014). As noted in this research, the activities of the procurement function include the identification of requirement, determining specifications, sourcing for suitable suppliers, negotiating contracts, receiving products and services, carry out quality inspection, storing, managing inventory, contract management, and inbound distribution of goods and services. It is argued that these activities can be used to instil sustainability practices into the O&G sector supply chain (Grant et al., 2015). For example, in the selection and contract negotiation phases, procurement professionals could put forward their sustainability requirements to suppliers by integrating environmental, social and economic

factors into the supplier selection process. The need for supplier involvement and support for achieving sustainability, which is the job of the procurement function, has been acknowledged within the sustainability literature (Jabbour et al., 2014; Kumar and Rahman, 2016). In particular, Meehan and Bryde (2015, p. 983) argued thus: *"Procurement plays a key role in delivering sustainable outcomes through creating, developing, controlling and sustaining the links between organisations and their supply chains to avoid commitments that are only superficial and non-compulsory"*.

Furthermore, the influence of the procurement function on the supply base subsequently eliminates the doubt of whether it can contribute extensively to sustainability movements (Meehan and Bryde 2011; Mena et al., 2014). Contrary to past beliefs that procurement is just a support function (Cox et al., 2005; Kaufmann and Carter, 2004), it is now considered a strategic function, which can help firms gain competitive advantages (Allal-Cherif and Maira, 2011; Grant et al., 2015; Roman, 2017). This is mainly because the procurement function has the ability to achieve TBL earlier than all other singular functions in an organisation (Mena et al., 2014). Figure 2.1 depicts some of the key issues within the procurement function aligned with the TBL of sustainability. The realisation of these key issues could automatically lead to sustainability and vice-versa.

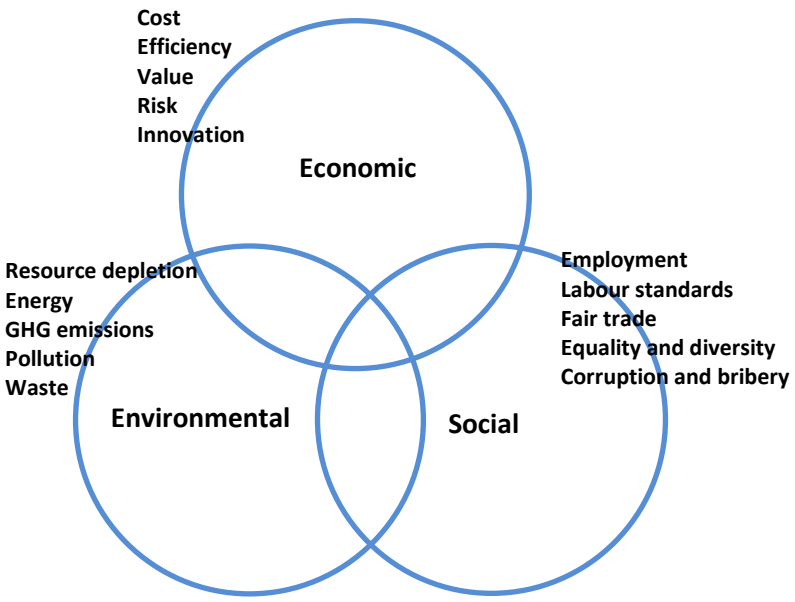

Figure 2.1: The triple bottom line: key procurement issues
(Mena et al., 2014, p. 172)

The researcher's interpretation of Figure 2.1 is that the challenges faced by the procurement function identified therein fall squarely on the three facets of sustainability, which therefore indicate that by achieving sustainability objectives these challenges can also be achieved. This observation again supports the compatibility of sustainability goals and the goals of the procurement function and that of the firm in general. In addition to this argument, in Mishra et al. (2013) the procurement function is considered a strategic area of focus for contemporary firms to remain cost-effective and competitive in an environment, which is characterised by increasing global competition and declining profit margins. This assumption fits no other but the O&G sector, which is presently experiencing its worst-ever oil price plunge. Zsidisin and Hendrick (1998) made early efforts to identify the importance of the procurement function. According to them, the procurement function is an important source for firms to manage their environmental performance. Undeniably, the new role of the procurement function is not a universal view as already noted in this research because critics still believe that the procurement function is nothing but a support function (Cox et al., 2005; Kaufmann and Carter, 2004) and cannot be useful in sustainability deliverables.

Whilst it is argued that sustainability practices require cooperation and collaboration (Hasselbalch et al., 2015; Walker and Jones, 2012), such collaboration can lead to risk reductions and competitive advantage through the sharing of information, resources, ideas and technology (Allal-Cherif and Maira, 2011). The need for cooperation and collaboration within the O&G sector procurement function and the limitations of traditional procurement approaches have been discussed in this research. In addition, the incorporation of sustainability into the procurement process cannot be overemphasised, considering the rising concerns on the environment and society as well as the need for firms to eliminate risk and improve their performance (Aktin and Gergin, 2016; Morgan, 2010). The above discussion highlights the significant role the procurement function can play in the realisation of sustainability goals (Krause et al., 2009; Roman, 2017). Thus, this section has justified the suitability of the procurement function in sustainability deliverables. The next section, therefore, focuses on addressing the main research concept – *sustainable procurement,* which is the focus of this research.

2.8 Sustainable procurement

The need to manage the operations of firms in a sustainable manner that has little or no impact on the environment and society is becoming a major concern for firms (Aktin and Gergin, 2016). The role of SP in realising corporate sustainability has received increased attention across a number of disciplines both nationally and internationally in recent years. SP is a subset of sustainable development (Erridge and Hennigan, 2012; Kalubanga, 2012), which emerged from the SSCM concept (Roman, 2017) and stresses on the role of the procurement function on reducing the impact of firms' activities to the environment and society (Ekiugbo and Papanagnou, 2017; Erridge and Hennigan, 2012; Hughes and Laryea, 2013). This process involves the assessment of a firm's sustainability practices and those of its suppliers in procurement decisions by examining the impact of such procurement to the environment and society (Islam et al., 2017b; Rao and Holt, 2005). For instance, firms must take cognisance of who and where they purchase from, the terms and conditions of what they purchase, and even the production processes involved in what they purchase (Meehan and Bryde, 2015).

There are multiple definitions of SP (Mansi, 2015). This situation has made a generally accepted definition of SP scarce (Islam et al., 2017b). However, the most notable ones found in the literature are highlighted in Table 2.3 for reference purposes. These definitions are highlighted base on their popularity, usability and relevance to this research and should, therefore, be view as illustrative rather than comprehensive. The researcher attributes the differences observed in these definitions to the fact that they are all outputs of different backgrounds and sectors (Walker et al., 2012). Nevertheless, they all stress the need to encourage the incorporation of sustainability measures into the procurement process. SP research has predominantly concentrated on developed countries in the public sector and manufacturing sector (Brammer and Walker, 2011; Kalubanga, 2012), and according to Walker and Brammer (2009) and Walker et al. (2012), these researches looked mainly at the environmental aspect isolating the social and economic aspects.

Table 2.3: Some definitions of SP

Definitions of sustainable procurement	Authors
"giving due consideration to the impact of the procurement on the environment, on the community and on the social conditions of those delivering or receiving the product of the service"	Welsh Procurement Initiative (2004, p. 5)
"a process whereby organisations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organisation, but also to society and the economy, whilst minimising damage to the environment"	Department for Environment Food and Rural Affairs (DEFRA) (2006, p. 10)
"thinking carefully about what to buy, buying only what you really need, purchasing products and services with high environmental performance and considering the social and economic impacts of purchasing decisions"	UNEP (2008, p. 6)
"a procurement that is consistent with the principles of sustainable development, such as ensuring a strong healthy and just society, living within environmental limits, and promoting good governance"	Walker and Brammer (2009, p. 128)
"Sustainable procurement is about understanding the three pillars of sustainable development (environment, society and economy) and using this knowledge to make better informed, ethical choices about the products that we buy."	Rice (2009, p. 38)
"Sustainable procurement can be defined as the process used to secure the acquisition of goods and services ('products') in a way that ensures that there is the least impact on society and the environment throughout the full life cycle of the product"	Meehan and Bryde (2011, p. 97)
"Sustainable procurement in its various guises is a policy objective in public procurement and is the pursuit of sustainability objectives in the purchasing and supply process"	Walker and Brammer (2012, p. 260)
"a process of acquiring goods, works and services from a supplier that provides the optimum combination of whole life costs and benefit to meet the customer's requirement"	Kalubanga (2012, p. 2)
"the pursuit of sustainable development objectives through the purchasing and supply process"	Walker, et al. (2012, p. 201)

Sustainability, as argued by Carter and Rogers (2008), involves the TBL approach and the simultaneous study of the three features is highly recommended in the sustainability literature (Mena et al., 2014). With this in mind, the researcher takes an inclusive approach of the TBL and therefore defines SP as:

> *"The procurement of goods, equipment, machinery and services by a firm, which process includes the selection and evaluation of suppliers and contractors, together with sub-suppliers and sub-contractors, that not only considers price, quality and speed but also the environmental, economic and social impact of such procurement process to the firm and society"*.

This definition takes an encompassing view of sustainability facets and is therefore deemed appropriate, especially with regards to this research and in accordance with the sustainability literature (Meehan and Bryde, 2011; Schneider and Wallenburg, 2012). The scope of this research is restricted to the procurement function, which includes purchasing and other activities within the procurement process. Therefore, the investigation of SP practices in this research shall include the procurement of machinery, equipment, landed properties, rigs, production platforms, services and even the purchase of minor items such as office stationery and cleaning wares. By limiting the scope of this research to the procurement function, the researcher can focus on examining only the sustainability practices with a direct link with the procurement function. This is also particularly important as the phenomenon of this research relates to how the procurement function can be utilised to drive sustainability and firm performances.

Sustainability literature has highlighted the growing need for firms to improve profitability and social well-being while at the same time minimising their environmental impact. This approach has led to the involvement of suppliers, contractors and other stakeholders (Aktin and Gergin, 2016; Jabbour et al., 2014; Kumar and Rahman, 2016). This has become necessary to overcome not just financial challenges, but also environmental and social challenges emanating from their operations. In fact, Walker et al. (2012) suggest that SP should be conceptualised from these three perspectives, i.e. environmental, economic and social. This research adopts this perspective as indicated in the definition given above and aims to investigate SP practices from this viewpoint. This is important since SP literature urges firms to adopt not just economic, but also environmental and socially responsible purchasing practices that have positive impacts on all stakeholders (Islam et al., 2017b).

However, the inclusion of environmental and social criteria to the traditional economic emphasis of the procurement function means more effort is required to overcome the difficulty this would bring to the procurement process (Crespin-Mazet and Dontenwill, 2012). To overcome this difficulty different models and theories have been published within the extant sustainability literature. For instance, studies that proposed ways of integrating sustainability measures into the supplier selection and evaluation process exists (Amindoust et al., 2012; Azadnia et al., 2015; Bai and Sarkis, 2009; Buyukozkan and Cifci, 2012; Ersoy et al., 2012; Govindan et al., 2013; Humphreys et al., 2003). Similarly, studies that proposed ways of incorporating sustainability measures into the procurement process also exists (Berry and McCarthy, 2011; British Standards Institute, 2010; Coşkun et al., 2012; Maignan et al., 2002). These measures, i.e. *environmental, product responsibility, health and safety, human rights, diversity, philanthropy, procuring from small and local suppliers, community development, and sustainable economic development,* commonly referred to as dimensions, reflects the TBL facets of sustainability and encapsulate the different SP practices as presented in the literature.

What then is practice? Practice has been defined in several ways. However, these definitions all seem to have the same meaning. For example, the online English Oxford Living Dictionary defined practices *as "the actual application or use of an idea, belief, or method, as opposed to theories relating to it"*. This same source also defined practice as *"the customary, habitual, or expected procedure or way of doing of something"*. In line with these definitions, and the extant literature review conducted this research can no doubt assume that SP practices are the direct actions that firms can implement to bring about corporate sustainability as shown in table 2.4 (Appendix 1).

Table 2.4: List of SP practices

SP dimensions	*Practices*
Environment	***Environmental*** *(Carter and Jennings, 2004; Mansi, 2015)* ▪ Adopt a policy to recycle, reuse and disassemble products ▪ Adopt a policy to reduce waste and packaging material ▪ Adopt a policy to promote environmental responsibility ▪ Adopt a life cycle analysis (whole life costing approach) of products ▪ Purchase products and services that are environment-friendly ▪ Adopt a policy to use efficient and/or green energy ▪ Be ISO 14001 certified ▪ Adopt environmental management systems ▪ Have procedures for checking and preventing pollution ***Product responsibility*** *(Mansi, 2015)* ▪ Adopt a policy to purchase recycled-content products ▪ Selects products with environmental attributes that minimise the environmental impact ▪ Adopt policy which systematically integrates environmental and social considerations into all production activities ▪ Ensure that suppliers abide by all minimum standards and laws ▪ Adopt a policy to evaluate the environmental friendliness of the production process ▪ Adopt a policy for suppliers to design, manufacture, produce and distribute products that reduce the use of energy ▪ Adopt a policy on reducing transportation costs ▪ Adopt a policy on cleaner production ▪ Adopt a policy to evaluate suppliers' environmental performance
Social	***Health and safety*** *(Carter and Jennings, 2004; Mansi, 2015)* ▪ Ensure that manufacturing locations are operated in a safe manner ▪ Ensure safe incoming movement of product to facilities ▪ Ensuring occupational health and safety of workers ▪ Review periodically the health and safety measures at construction sites and of suppliers ▪ Be OHSAS-18001 (Occupational health and safety management systems) certified ***Procuring from small and local suppliers*** *(Walker and Brammer, 2009)*

	Human rights, labour conditions and decent work *(Carter and Jennings, 2004; Mansi, 2015)* ▪ Adopt a policy on promoting human rights and labour conditions ▪ Adopt a policy on non-discrimination and child labour ▪ Adopt a policy on 'living wage' greater than a country's or region's minimum wage ▪ Adopt a policy to comply with ILO standards ▪ Participate in UN's Global compact programme ▪ Have effective redress of grievances system ▪ Adopt a policy on equality, where every employee, without discrimination, has the right to equal pay for equal work ▪ Adopt a policy for workers with disabilities ▪ Provide training on human rights policies or procedures concerning aspects of human rights relevant to operations ***Diversity*** *(Carter and Jennings, 2004; Mansi, 2015)* ▪ Purchase products and services from minority/women-owned business enterprise (MWBE) ▪ Have awareness programs to ensure diversity practices ▪ Have diversity program to encourage suppliers to work with minority, smaller business, and women-owned business to empower diverse communities ▪ Support associations and programs that strengthen diversity ▪ Adopt a policy to respect the diversity and differences of their employees to promote a comfortable and safe work environment ***Community development*** *(Carter and Jennings, 2004; Mansi, 2015; Walker and Brammer, 2009)* ▪ Adopt a policy on wellbeing and welfare of the society ▪ Adopt a policy to provide education and training for the social development of communities ▪ Adopt a policy to improve the living conditions of communities and manufacturing units spread across its manufacturing plants ▪ Engage in social activities to support social-economic and community development ▪ Adopt a policy on health and hygiene on its manufacturing plants ▪ Organise medical check-up camps for workers at its operating sites

	▪ Have anti-corruption policies ▪ Adopt a policy to recruit local and minority people ▪ Adopt a policy to source from small and local suppliers to provide economic benefit to the community ***Philanthropy*** *(Carter and Jennings, 2004; Mansi, 2015)* ▪ Volunteers at local charities ▪ Donates to philanthropic organisations ▪ Adopt a policy to donate at local communities to enhance the wellbeing of local people ▪ Encourage suppliers to participate in philanthropy activities
Economic	***Economic development*** *(Carter and Jennings, 2004; Mansi, 2015)* ▪ Adopt a policy on fair trade practices ▪ Adopt a policy on ethical practices ▪ Adopt a policy to enhance transparency measures ▪ Adopt a policy to encourage innovation ▪ Adopt a policy to ensure sustainable economic development in the area where the manufacturing and operations unit is located ▪ Adopt a policy to provide infrastructure development (services)

Table 2.4 is the result of the in-depth literature review carried out in this research to determine the underlying dimensions of SP practices. An understanding of the extant literature signifies that the operationalisation and measurement of SP practices are based on the variables highlighted above (Brammer and Walker, 2011; Carter and Jennings, 2004; McMurray et al., 2014; Mansi, 2015; Walker and Brammer, 2009). It is however, worth noting that Table 2.4 has been modified to reflect the TBL and the context of study, which is characterised by engineering-intensive activities, lack of infrastructures, and political issues (Ahmad et al., 2016a; Infante et al., 2013; Ngoasong, 2014; Vaaland et al., 2012). The above approach is appropriate since there is no specific SP scale in this sector due to the small body of literature on SP, especially in the context under study. In addition, the researcher argues that the above dimensions and corresponding practices are in line with the sustainable procurement disclosure index (SPDI) developed by Mansi (2015), which firms are expected to report on. This approach is taken to determine the depth of SP practices which is interchangeably used with other related terms like SSCM, GSCM, sustainable purchasing etc.

There are a considerable number of academic studies that looked at sustainability practices within inter-organisational structures, i.e. SSCM (Carter and Rogers, 2008; Gupta and Palsule-Desai, 2011; Morali and Searcy, 2013; Wittstruck and Teuteberg, 2012), and GSCM (Ahi and Searcy, 2013; Appolloni et al., 2014; Holt and Ghobadian, 2009; Srivastava, 2007; Vachon and Klassen, 2006). Similarly, studies that addressed SSCM (Ahmad et al., 2016a; Ahmad et al., 2016b), CSR (Alabi and Ntukekpo, 2012; Amujo et al., 2015; Ihugba, 2012; Ite, 2004; Musa et al., 2013; Parast and Adams, 2012; Raufflet et al., 2014) and environmental sustainability (Ambituuni et al., 2014; Nwagbara, 2013; Schneider et al., 2013; Zabbey et al., 2017) within the O&G sector in particular are also prevalent. In addition, there are several studies that examined other aspects of sustainability practices (Fossgard-Moser, 2003; George et al., 2016; Infante et al., 2013; Ite, 2007; Schneider et al., 2011; Yusuf et al., 2013) within the O&G sector. However, to gain a coherent understanding and in appreciation of the literature on and concerning SP, the researcher will review SP concept and other related terms, e.g. green purchasing, sustainable purchasing, environmental purchasing, GSCM or SSCM. This approach is evidence within the supply chain sustainability literature in which the procurement function exists.

Early developments in SP can be traced back to the 2002 World Summit on Sustainable Development where the role of government agencies in promoting public procurement policies, which encourage development and diffusion of environmentally sound goods and services, was stated. This proclamation yielded instantaneous results especially within developed countries where guidelines, reports, and frameworks for implementing SP were made available. The need for private sector involvement in realising sustainability goals has been reiterated recently by the UN in its Paris Agreement adopted in 2015 (United Nations, 2015). Going forward, several studies have investigated SP practices and its implications outside the O&G sector, especially within the manufacturing and public sectors. These investigations proffered various views on the concept, indicating its broad and multi-disciplinary nature. More importantly, evidence from the literature indicates that private sector firms engage more in SP practices compared to the public sector (Islam et al., 2017a;

McMurray et al., 2014). However, the position or contribution of the O&G sector in this new trend of SP is uncertain.

Helen Walker, Neil Jones, and Stephen Brammer are among authors that conducted some of the most prominent and notable studies on SP practices (Mansi, 2015). For instance, the international comparative study of SP practices by Brammer and Walker (2011), although from a public sector perspective, provided comprehensive detail and evidence highlighting important issues and implications in engaging in SP practices globally. The study, which relied on responses from 280 procurement practitioners from 20 different countries, not only suggest SP is understudy within developing countries, especially Africa region, but also provide useful insight for understanding SP practices. Walker (2013) further supports this observation in her study where it found only three articles have addressed sustainability issues within the supply chain context from the Africa region. In line with Walker et al. (2008) who investigated both the public and private sectors, the comparative study also highlights several drivers and barriers to implementing SP practices.

The study of Walker and Brammer (2009) which investigated the UK public sector found variations in the implementation of SP practices. The study found *'procurement from small and local suppliers'* to be the most implemented SP practices, followed by *'health & safety',* and *'human rights, labour condition and decent work'* practices, with *'product responsibility'* and *'diversity'* practices less implemented (Walker and Brammer, 2009). Like other SP studies, the study also establishes some drivers and barriers to SP implementation, implying that the drivers and barriers to SP do vary across industries and locations. Walker and Brammer (2012) also examined the relationship between SP and e-procurement – the use of ICT systems to enhance efficiency and transparency in procurement. They found that e-procurement can help in delivering SP targets especially in the aspects of the environment, health and safety and labour conditions, but could deter the aspect of buying from local and small suppliers. In corroboration with similar studies, i.e. Vachon and Klassen (2006), the study also found that communication between firms and suppliers have a positive impact on environment, health and safety and labour conditions aspects of SP.

Focusing on the health and social care sector in Northern Ireland, Erridge and Hennigan (2012) examined SP practices and found a strong relationship between the effective implementation of SP and organisational efficiency and economic recovery. They also observed the existence of attitudinal barriers to implementing SP from some employees, while others displayed a positive attitude concerning sustainability. This corroborates the findings of Walker et al. (2009) where similar view was held including the lack of organisational commitment and adverse public perceptions as barriers to SP, whereas top management support and the provision of training for procurement staff were found to be enablers. Insight from these findings indicates that more needs to be done to increase awareness and clarify the implications of SP to practitioners.

Still concentrating on the public sector, Lund-Thomsen and Costa (2011) explored SP practices within the UN and their effect on developing countries. In summary, their study identified external drivers, internal incentives and barriers to SP adoption and the potential consequence of SP adoption. For example, the study found external pressure and guidance from NGO as drivers for adopting SP practices and lack of conceptual clarity and increase costs were observed as barriers. According to the study, the consequences of adopting SP practices for developing countries are both positives and negatives. For example, positive impact such as improve social and environmental performance can be realised, while reduced earnings, market distortion and market access barriers are noted as the negative impacts of engaging in SP. In a similar study, Hasselbalch et al. (2015) explored the barriers to SP within the UN. Their study found lack of SP strategy to be the most prevalent barrier to SP implementation, alongside lack of political mandate, lack of resources, lack of information, lack of tools and other market barriers, such as availability and demand for sustainable products.

Scrutinising the deficiency and robustness of SP implementation, Haake and Seuring (2009) in their study argued that SP practices and indeed research, has failed to include the procurement of minor items in the development of a conceptual understanding of what SP entails. They argued that in line with the tenet of true sustainability, *'no item is without significant risk'* (p. 292) so therefore policymakers, practitioners and researchers should

consider the procurement of minor items or give a reasonable justification for their omission. Concurring to this very essential piece of literature, this present research is taking a robust stance by including major and minor items as already noted earlier on in this chapter. Already there is an indication from the study of Fossgard-Moser (2003) suggesting that SP practices are not only prevalent within the O&G sector, but that the procurement of minor items is also considered from a sustainability perspective.

Confirming the increase in the adoption and implementation of SP practices, Meehan and Bryde (2015) examined the UK social housing sector and found strong SP presence as against the findings of their earlier study (Meehan and Bryde, 2011). This finding is in line with the extant literature, which suggests there has been an increase in the adoption and implementation of SP practices within private and public firms (Brammer and Walker 2011; McMurray et al., 2014; Roman, 2017). Meehan and Bryde (2015) also observed amongst other things, that SP is heterogeneous in nature and that its development is driven by clear policies and strategies. Supporting the findings of Walker and Brammer (2009), Meehan and Bryde (2015) also found *'procurement from small and local suppliers'* to be the most implemented SP practices within the housing sector. This similarity could be linked to the fact that both emanate from the public sector.

However, in a recent study of SP practices of Saudi Arabia private and public firms, Islam et al. (2017b) found that only environmental and philanthropy dimensions of SP have been incorporated by the sampled firms. Social dimensions, such as health & safety, diversity, human rights, labour conditions, purchase from small and local supplier were not found in their study. Islam et al. (2017b) also found that there is no significant relationship between the academic qualification of personnel and SP implementation. Although, they did not fail to signpost that this could be because the respondents' educational background may not include sustainability components. This assumption can be considered valid considering the findings of Walker et al. (2009) where specific SP training is found to drive its implementation.

The observation held by Islam et al. (2017b) is somewhat in line with that of Young et al. (2016) where environmental aspects of SP is perceived to be in the forefront of sustainability initiatives in higher education institutions in Australia. In general, the study of Young et al. (2016) confirmed that sustainability measures within the sector are incorporated via the purchasing function, and that cost is a major barrier to SP implementation. They also observed that the implementation of SP could be better if understanding, knowledge and implications of SP are understood within the organisational structure. They recommend the need for strong leadership to aid in building knowledge of SP across the organisational structure. The study of Grandia (2016) also supports the view that knowledge about sustainability increases the propensity to implement SP practices. Furthermore, Roman (2017) in line with the extant literature also highlights the role of good leadership style for stimulating SP implementation. According to Roman (2017), top leadership involvement is an essential driver of SP. The empirical result from Roman's study shows that transformational leadership plays a crucial role in determining the adoption of SP practices. The study also found that organisational innovativeness and stakeholder expectations are also critical to SP adoption.

Some of the points highlighted in the preceding paragraph are also in line with the thoughts of Kalubanga (2012) who explored SP from a developing country, i.e. Uganda perspective. According to Kalubanga (2012), there is still a lack of understanding in relation to SP concept, especially within developing countries. He stressed that SP is barely heard of either as a concept or as practice, within developing countries. Chari and Chiriseri (2014) in their research found that SP is not been practice in Zimbabwe, a developing country within the continent of Africa. They specifically noted that environmental and social factors are not considered in purchasing decisions. The studies of Adebayo (2015) and Oyewobi et al. (2017) appear to be the only studies, which clearly examined SP within Nigeria. These studies also found that sustainability issues are not been addressed in local government and construction industry procurement decisions respectively. Although improvements have been recorded in other studies (e.g. Akamp and Müller, 2013; Esfahbodi et al., 2016; Huq et al., 2014; McMurray et al., 2014; Silvestre, 2015) a lot still needs to be done. This is applicable within the Nigerian O&G sector context where little is known about SP practices

Still from a developing country perspective, McMurray et al. (2014), who investigated SP practices within Malaysian private and public sector firms, observed that passion for improving working conditions, firms' reputations, organisational efficiency and transparency are the main drivers for implementing SP practices, while a lack of awareness was observed to be the most significant barrier to implementation (Ekiugbo and Papanagnou, 2017). This corroborates previous arguments on awareness as a barrier to SP practices. However, this is not the case in Walker and Brammer (2009) where cost was found to be the main barrier whilst support from top management was found to be the main driver for implementing SP practices. In collaboration with Walker and Brammer (2009), Lund-Thomsen and Costa (2011) also noted that cost was a major barrier for engaging in SP practices. Although the context of both types of research could trigger these findings since both are from public sector domain, similar studies from the private sector have found correlated results (Giunipero et al., 2012; Walker and Jones 2012; Yusuf et al., 2013). This, therefore, indicates that cost is a major barrier in both private and public sector settings.

Overall, these studies illustrate the heterogeneity of SP concept and highlight the significant role of organisational culture, government regulations, cultural and stakeholder differences play in shaping sustainability campaign. Although these studies posited how complex SP practices can be, they also highlight the positive impacts of engaging in SP practices. Collectively, these studies indicate that considerable upfront financial investment is required to operationalise SP practices. A significant observation in the extant literature is the frequent calls for SP research in developing country context. Although efforts have been made in this regard, little is known about SP practices in Nigeria. This study, therefore, intends to bridge this gap by providing useful and important insights into the adoption and implementation of SP practices. The next section examines some of the impacts of SP implementation on firm performances.

2.8.1 Impacts of SP practices on firms' performances

To have a procurement function that is sustainable, firms must improve their performances in all three dimensions of sustainability, i.e. economic, social and environment. The

traditional approach that only focuses on financial performance has been criticised, with authors accentuating that it could lead to organisational failure (Hall et al., 2012; Pagell and Wu, 2009; Silvestre, 2015). Sustainability performance is defined as *"the performance of a company in all dimensions and for all drivers of corporate sustainability"* (Schaltegger and Wagner, 2006, p.2). The extant literature posits that the impact of implementing SP practices on firms' performances comes in multiple folds. For instance, environmental and social performances can be improved by implementing SP practices.

Whereas there is substantial empirical evidence to show that SP practices lead to both environmental and social improvements, there is little empirical evidence demonstrating that SP practices can lead to improved financial performances. This situation has made several industry leaders and practitioners to believe sustainable practices are disadvantageous (Yook et al., 2018). A recent study of Islam et al. (2017a) which focused on the impacts of SP practices on organisational performances within Saudi Arabia found a significant indirect relationship between combined SP practices and firms' financial performance. No evidence of direct significant impact of the summary measures of SP practices on financial performance was observed by these authors. Although, the study of Islam et al. (2017a) provided some useful insights, to some extent, it contradicts evidence from SP literature on firms' performances (Bobis and Staniszewki, 2009; Bose and Pal, 2012; Esfahbodi et al., 2016; Pullman et al., 2009; Bag, 2012; Zhu and Sarkis, 2004). Contradictions such as this, confirm the mixed views regarding the impact of SP practices on firms' financial performance and increases the challenges currently been faced by industry leaders and practitioners in implementing SP practices.

A clear understanding of the impact of SP implementation on firms' financial and nonfinancial performances is essential to encourage industry leaders and practitioners and for moving the SP campaign forward (Roman, 2017). This present study has therefore made it a point of interest, as highlighted in the objectives, to examine the impact of SP practices on the sampled firms' performances. This is important considering the mixed views held within the literature and for building a business case for sustainability (Ruparathna and Hewage, 2015). Although the veracity of the literature regarding the benefits of

implementing SP practices is still vague, a plethora of studies has held the view that SP practices have no negative impact on firms' performances. In view of this, firms are encouraged to take a proactive approach by considering the adoption of SP to overcome sustainability challenges and contribute to the achievement of sustainable development.

2.8.2 The triple bottom line of SP

As noted earlier, TBL is the three facets of sustainability, which comprise environmental, social and economic performances as shown in Figure 2.2 (Carter and Rogers, 2008). It is observed from the SP and extant sustainability literature that firms who adopt the TBL approach do not only positively improve on their environmental and social performances but also stand a chance of achieving long-term economic benefits and competitive advantages. In addition to the three facets noted above, Carter and Rogers (2008) also cited four supporting features, i.e. risk management, transparency, strategy and culture, which they claim work side by side with the three facets of sustainability. Carter and Rogers (2008) are of the view that these four supporting facets play a vital role in achieving sustainability. Gopalakrishnan et al. (2012) have however noted that it is not clear how the three dimensions of sustainability can be integrated to achieve the best results.

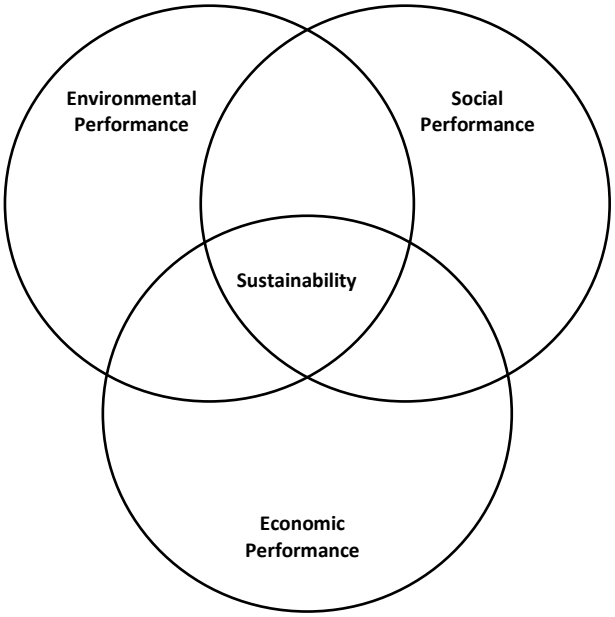

Figure 2.2: Sustainability: the triple bottom line
(Carter and Rogers, 2008, p.365)

Nevertheless, firms are urged to consider the TBL approach in their operations, including the procurement of goods, materials, equipment, services and utilities. This practice is in line with the extant SP literature, which emphasised the inclusion of the three elements of sustainability, even though they pose a challenge (Linton et al., 2007). In support of this reasoning, Schneider and Wallenburg (2012) also argued that a firm is considered to have adopted sustainability measures only if the three facets of sustainability, i.e. environmental, social and economic, are investigated simultaneously. Meehan and Bryde (2011) also emphasised that the three facets of sustainability are interrelated and therefore should be integrated concurrently. Carter and Easton (2011), who stressed the importance of studying the three facets of sustainability simultaneously, held similar views. The TBL as they relate to SP practices is discussed in the preceding subsections.

2.8.2.1 Environmental aspects of SP

This aspect of TBL remains one of the most significant challenges that humankind is facing (United Nations, 2015). For instance, challenges such as climate change, global warming and resource depletion are major fears in the mainstream media due to their expected resulting consequences (BBC, 2011; International Energy Agency (IEA), 2013; Yusuf et al., 2013). The above challenges have made environmental issues a major concern for the O&G sector needing immediate attention. The environmental aspect of SP is concerned with firms' performances in managing and preserving natural resources, as well as reducing the impact of their activities on the environment. For instance, oil reserves depletion demand that firms consider the use of renewable sources of energy (green energy) and cut down on their GHG emissions (Bracho 2000).

The environmental aspect also requires firms to reduce their carbon footprints, air pollution, the amount of resources purchase and use, while also participating in product design for recycling or reuse. In addition, it requires firms to purchase products that can be recycled or reused, purchase products that are environmentally friendly, and reduce packaging materials and waste. Firms are also required to encourage suppliers to commit to waste reduction goals, adopt green travel, dispose of chemical waste properly, and work towards

achieving ISO-14001 certification and other relevant certifications that can help stimulate SP implementation (Carter and Jennings, 2004; Hughes and Laryea, 2013; Walker and Brammer, 2012).

It is argued that these practices can help firms reduce their environmental impacts while at the same time lowering their costs (Mena et al., 2014). For instance, by sourcing and producing more efficient products, firms are likely to use fewer resources, i.e. materials, water and energy, and spend less on disposing of waste. The literature posits that environmental initiatives by firms increase efficiency and productivity, which can lead to increased profits for adopting firms (Mollenkopt et al., 2010). The adoption of SP practices is positively linked with improving firms' environmental performance (Bag, 2012; Bobis and Staniszewki, 2009; Esfahbodi et al., 2016; Vachon and Klassen, 2006; Zhu and Sarkis, 2004). However, the negative effects of not mitigating environmental challenges can result in flooding, drought and famine, which can hitherto lead to food scarcity and developmental disruption (Bracho, 2000).

2.8.2.2 Social aspects of SP

The social aspects of SP are concerned with the welfare of individuals and communities. Although some authors believe that this aspect of the TBL is understudied (Brent and Labuschagne, 2007; Sarkis et al., 2010), an evaluation of this aspect of the TBL to date shows that there is a growing number of research work in this area, indicating improvements in this aspect of the TBL. The social aspect promotes firms' performances in improving the standard of living for citizens and communities, by ensuring sustainable development initiatives are adopted and that citizens' political and economic rights are not abused (Brammer and Walker, 2011; Zorzini et al., 2015).

This aspect also concerns the adoption of good health and safety measures to provide safe working environments for employees across the entire supply chain and providing employees with regular health and safety training (Zorzini et al., 2015). A detail, though not exhaustive, list of social measures as covered in the extant literature are highlighted below

(Carter and Jennings, 2004; Hughes and Laryes, 2013; Mansi, 2015; McMurray et al., 2014; Walker and Brammer, 2009).

- ***Diversity:*** purchase products and services from minority/women-owned business enterprise (MWBE); respect the diversity and differences of employees; demonstrate commitment by organising diversity awareness programmes for all stakeholders
- ***Health and safety:*** ensuring occupation health and safety of employees; ensure a safe working environment for all stakeholders.
- ***Human rights:*** promoting human rights and labour conditions; complying with child law; ensuring suppliers adhere to child labour laws; ensuring suppliers are treated fairly; paying a 'living wage' greater than a country's minimum wage; promote equality where every employee is treated fairly.
- ***Philanthropy:*** engaging in voluntary activities; donate to local communities to enhance the well-being of the local people; donate to philanthropic organisations; volunteers at local charities.
- ***Community development:*** provide education and training for social development of communities; ensure wellbeing and welfare of the society; engage in social activities to support social-economic and community development; buying only from businesses with good sustainability practices; preserving community cultures and promoting sustainable human development.
- ***Procuring from small and local suppliers*** ensuring that small and local firms are given to chance to strive.

The inclusion of social criteria into the procurement process is considered significant and beneficial in the extant literature. For instance, there is evidence confirming that SP practices improve social performances of firms within the UK and Saudi Arabia (Islam et al., 2017a). According to an OECD (2008) publication, social performances also improved in Switzerland because of implementing SP practices. To mitigate reputation risks, firms are encouraged to consistently develop a good working relationship with not just their suppliers but also with key stakeholders including local communities.

2.8.2.3 Economic aspects of SP

The economic aspect of SP facilitates the achievement of firms and communities' economic performances while making sure that the environmental and social aspects of SP are protected. Although it has remained a continuous area of debate, considerable amount of studies suggests that there are positive links between the adoption of SP practices and economic performance (Bobis and Staniszewki, 2009; Esfahbodi et al., 2016; McMurray et a., 2014; Pullman et al., 2009; Bag, 2012). The economic aspect of SP is considered the end result of achieving the environmental and social aspects of SP such as creating employment, assisting SMEs, reducing market entry barriers by allowing open competition, and providing economic development infrastructures (Yusuf et al., 2013).

Apart from the financial benefits, the economic aspect of SP ensures that firms' activities do not lead to either environmental or social degradation (Tsai et al., 2009). Buying from local and small suppliers, as well as buying from minority or women-owned business enterprises, which falls under the social aspect of SP, can also be classified under the economic aspect, because these practices can boost the economic well-being of not just the firm but also that of suppliers and communities (Nijaki and Worrel, 2012). In addition, environmental measures such as a reduction in energy consumption and waste can lead to economic benefits for adopting firms and their stakeholders (Mena et al., 2014). The efficient and effective utilisation of scarce resources by firms can help reduce the effect their activities have on the environment and society and lead to their long-term existence and profitability (Yusuf et al., 2013).

As already noted, a considerable amount of research findings revealed a positive relationship between the implementation of SP practices and firms' financial performances (Flynn, 2012), signalling a progression in SP practices as against early studies (Bowen et al., 2001). Although critics, especially economists, have questioned the implementation of sustainability initiatives by expressing concerns on its impact on both income and capital investments, firms are urged to consider their social and ecosystems. To operationalise the economic aspect of SP practices, traditional approaches, such as cost, efficiency, value creation, risk management and innovation, should be considered alongside the

environmental and social aspects of SP practices to reap its financial benefits. The consideration of both social and environmental features can create a competitive negotiating and tendering process that can lead to financial savings for firms (Flynn, 2012). The economic aspect of SP also emphasised that firms should shun bribery and corruption by carrying out procurement activities in ethical manners.

In summary, this section has emphasised, in line with the extant literature, the need for firms to implement the TBL to achieve full sustainability. Although this is expected to add to the many challenges faced by procurement professionals, guidance on how SP can be operationalised was highlighted with regards to implementing the TBL within the procurement process. The importance of this section cannot be overemphasised considering current debates on what full sustainability entails, e.g. the application of all three aspects of sustainability. In the next section, some of the benefits associated with SP implementation are discussed to appreciate them.

2.8.3 Potential benefits of SP

The advocacy for SP practices is concerned with the increasing environmental and social issues and the benefits expected from its implementation to mitigate these issues. Although there are mixed views on the benefits of SP practices, what is certain is that benefits of SP practices vary and depends on the level of implementation (Lund-Thomsen and Costas, 2011; Willis, 2010; Young et al., 2016). In addition, the benefits of SP practices can only be realised with a commitment from all levels of the firm (Dawson and Probert, 2007; Hoejmose and Adrien-Kirby, 2012; Michelsen and de Boer, 2009). Some general benefits of SP practices as highlighted in McMurray et al. (2014) include:

- improving efficiency and transparency,
- improving compliance,
- financial savings,
- meeting goals and targets,
- improving the work environment,
- contributing to the modernisation and international competitiveness of the local industry,

- improving the quality of air and water,
- improving firms' images, and
- reducing the use of natural resources.

Further exploration of the literature revealed more SP benefits (Brammer and Walker, 2011; Kennard, 2006; Theron and Dowden, 2014) which include:

- creating employment and training opportunities,
- risk reduction,
- reducing transportation cost,
- controlling costs by adopting a wider approach to whole life costing,
- improving internal and external standards through performance assessments,
- complying with environmental and social legislation,
- managing risk and reputation,
- building a sustainable supply chain for the future,
- involving the local business community,
- attracting and retaining talent, and
- gaining a competitive advantage.

It is important to note that the benefits highlighted above are by no means exhaustive. Whilst some authors argue that SP practices can lead to firm competitiveness and reduce environmental and reputational risks (Rao and Holt, 2005; Rice, 2009; Walker and Jones, 2012), others opined that sustainability practices do not positively lead to financial or overall firm performance (Bansal, 2005; Hillman and Keim, 2001; Wagner et al., 2002; Wagner, 2005). It is noted that contradictory views such as these impede the growth of SP as practices. Having said this, the bulk of SP literature stressed that the implementation of sustainability measures attract considerable benefits (Kalubanga, 2012; Mena et al., 2014; Theron and Dowden, 2014; Wang and Sarkis, 2013; Yusuf et al., 2013). It has been stated that the adoption of sustainability measures can lead to immediate statistically significant gains in stock prices for large firms (Bose and Pal, 2012), as well as profitability, innovation and value creation (Zhu and Sarkis, 2004; Lee et al., 2011; Schoenherr, 2012). There is also

evidence suggesting that the implementation cost of SP is less compare to the cost reduction impact that SP has on practising firms (Theron and Dowden, 2014).

2.8.4 Drivers of SP practices

It is observed from the extant literature that there is a significant relationship between the implementation of SP practices and firms' sustainability performance. It is also evident that firms are compelled to adopt sustainability initiatives for different reasons. For example, the fact that SP practices can lead to some tangible and intangible benefits push firms to implement SP practices. These are generally referred to as drivers since they motivate firms to adopt SP practices (Gimenez and Tachizawa, 2012).

SP drivers are classified into two categories, internal and external drivers (Walker et al., 2008), with the external drivers, which comes in the form of government regulations and institutional pressure, consider more dominant in pushing firms towards adopting sustainability measures (Sroufe, 2003; Walker and Jones, 2012). For example, institutional pressure from government and non-governmental agencies is argued to be a major driver of adopting sustainability measures (Walker et al., 2008; Yusuf et al., 2013). However, expected benefits upon implementation are also considered major drivers of SP practices, for instance, the intention to improve organisational efficiency and environmental performance.

In addition, the organisational and structural process of the firm and procurement function can play a significant role in implementing SP practices (Walker and Brammer, 2009). For example, firms with good corporate values and supportive environments tend to support the implementation of best practices across their supply chains (Baker et al., 2006; Zhu et al., 2007). These all form part of the numerous drivers of SP practices within the existing literature some of which are highlighted in Table 2.5. Although a comprehensive list of the drivers of SP is difficult to find due to variability, context and application challenges, Giunipero et al. (2012), Walker et al. (2008) and Mena et al. (2014) have made some attempts in this direction. Whereas the drivers highlighted in Table 2.5 are by no means comprehensive and exclusive, they represent some of the most commonly cited drivers of SP practices within the literature. Given that this research is looking to explore SP practices

within a complex sector, such as the O&G from a developing country perspective, it sought to highlight those globally identified drivers of SP practices that are relevant to the study context.

Table 2.5: Key drivers of SP practices

S/n	Drivers	Sources
1.	Top management support and commitment	Walker and Brammer (2009), Giunipero et al. (2012), Mena et al. (2014), Walker and Jones (2012)
2.	Government policies and regulations	Giunipero et al. (2012), Walker and Jones (2012), Walker et al. (2008), Zhu and Sarkis (2006), Ruparathna and Hewage (2015)
3.	Organisation policies and strategies	Walker and Brammer (2009)
4.	Collaboration with suppliers	Seuring and Müller (2008), Walker et al. (2008)
5.	Pressure from stakeholders	Walker et al. (2008), Walker and Jones (2012)
6.	Cost reduction/improve resource utilisation	Mena et al. (2014), Walker et al. (2008)
7.	Gain a competitive advantage	Ruparathna and Hewage (2015), Walker et al. (2008), Yusuf et al. (2013)
8.	Improve environmental impact	Walker et al. (2008), Giunipero et al. (2012)
9.	Financial benefits	Giunipero et al. (2012)
10.	ISO 14001 Certification	Giunipero et al. (2012), Yusuf et al. (2013)
11.	Employee involvement	Hanna et al. (2000), Walker and Jones (2012)

The above drivers are among the most notable drivers compelling firms to adopt and implement SP practices regardless of the settings, sector, or location. These drivers are discussed in more detail below.

2.8.4.1 Top management support and commitment

This driver is observed to be one of the key facilitators of SP practices in both private and public sectors across all industries (McMurray et al., 2014; Mena et al., 2014; Walker and Brammer, 2009). This is so because managers are the key decision makers of major strategic business processes. Considering the costs involved in implementing SP practices, the approval and support of top management employees is a necessity, otherwise, such practices cannot be implemented, even where procurement employees have the zeal to do this. The literature on organisational change also stresses the crucial role of top

management support in implementing organisation change (Fernandez and Rainey, 2006; Kotter, 1995; McNulty and Ferlie, 2004). This indicates the role of top management support in implementing change across organisational levels is not new. Evidence within the SP literature shows that top management support and commitment is crucial for the successful implementation of SP practices (Crespin-Mazet and Dontenwill, 2012; Brammer and Walker, 2011).

2.8.4.2 Government policies and regulations

The role of the government in expediting sustainable practices across the world to realise sustainable development goals has been stress within the literature (Brammer and Walker, 2011; Roman 2017; Walker and Jones, 2012). Growing environmental and societal challenges have resulted in the enactment of strict environmental and social policies and regulations by different national and local authorities. Intent to comply with these regulations and policies compel firms to implement SP practices to monitor and reduce the impact of their business activities on the environment and society. Been an enacted law, firms are left with no choice other than compliance, in which case the failure to comply could lead to hefty fines and penalties. As a compulsory law, this driver is considered a powerful facilitator of implementing SP due to the attention it commands at all organisational levels. This indicates how significant it is for governments to adopt suitable regulations and policies that can be enforced and monitor properly. For example, the UK government approach to environmental standards is considered world class due to effective implementation and monitoring processes (Walker and Brammer, 2009; Brammer and Walker, 2011), which ensure that firms operating within the country meet minimum standards. Furthermore, government regulation is observed to be the major driver for implementing SP in Canada (Ruparathna and Hewage, 2015).

2.8.4.3 Organisational policies and strategies

Also identified within the extant literature is the role of organisational policies and strategies for SP implementation. The need for strategic alignment is crucial for implementing SP. Brammer and Walker (2012) emphasise the need for having an official planning and strategic process to facilitate the implementation of SP. Having a clear policy or strategy provide

employees with the framework with which to implement sustainable practices. It is observed that for firms' SP practices to have tangible significance on their operations and that of stakeholders, they should incorporate it into their corporate strategy (Galpin and Whittington, 2012; White, 2009). In stressing the need for clear policy or strategy, Tan et al (2011) argue that having a clear strategy and implementing the same can lead to competitive advantage. Firms are therefore advised to have a clear SP strategy that aligns with the overall organisational strategy to achieve several benefits, such as the implementation and preservation of sustainability practices (Galpin et al., 2015). According to McMurray et al. (2014) and Meehan and Bryde (2011), the need for a clear strategic direction is crucial for achieving SP implementation. By having a clear policy and strategy, employees would have a structured approach to follow when implementing and measuring SP practices.

2.8.4.4 Collaboration with suppliers

The need for supply chain collaboration has become pertinent within the production and operations management field, especially as it involves the TBL (Chen et al., 2017). Although it has been defined in different ways, it simply involves the cooperation and alliance of two or more entities working together to achieve common goals and benefits (Cao and Zhang, 2011). The impact of supply chain collaboration on performance is highlighted in Cao and Zhang (2010, 2011). See also Whipple et al. (2010) where a collaborative relationship is observed to have a greater impact on firm performance and customers satisfaction. As issues of sustainability intensify, firms are generally held accountable for their actions and those of their suppliers (Seuring and Müller, 2008). Collaboration with suppliers as it relates to the TBL has been deemed inevitable for firms aiming to achieve true sustainability (Beske and Seuring, 2014). This is true because the involvement of suppliers in achieving the TBL is repeatedly mentioned in the extant literature (Gimenez and Tachizawa, 2012; Nijaki and Worrel, 2012; Zsidisin and Hendrick, 1998). For example, collaboration with suppliers can help with managing and reducing sustainability risk. In other words, firms can gain competitive advantage and reduce their environmental burdens through collaboration with suppliers (Aktin and Gergin, 2016). However, this can only be achieved through a

commitment from the parties involved by investing in such a collaborative venture (Touboulic and Walker, 2015).

2.8.4.5 Pressure from stakeholders

There has been increasing stakeholders' pressure on firms to consider the environmental and social implications of their day-to-day business activities. Stakeholders' pressure has compelled firms to change the way they behave, especially as it relates to the impact of their operations and supply chain (Islam et al., 2017b). Stakeholders are typically individuals or organisational bodies that have an interest in the activities of a firm. For example, stakeholders may include customers, investors, governments, communities, NGOs and employees. It is constantly mentioned that stakeholder pressure is an essential driver of sustainability practices (Esfahbodi et al., 2016; Roman, 2017; Simpson and Sroufe, 2014; Walker and Brammer, 2009). For example, the role of top management support falls under the employee as a stakeholder in driving SP practices implementation. As well as top management employees, low-level employees also influence organisational change through their commitment or resistant to change.

The awareness of environmental and societal challenges has resulted in increased customers' expectations putting pressure on firms to participate in sustainability practices. The conscious behaviour of customers concerning the quality of products and services been offered by firms goes beyond price as evidence within the literature shows that customers are also particularly concern about the production processes. It is equally observed within the literature that customers are reluctant to pay premium prices for sustainable products. Thereby leaving some firms in a very difficult position of trying to meet customers' expectations and organisational goals. Furthermore, environmental groups and social advocates are observed to contribute immensely in driving firms toward sustainability practice implementation through continuous awareness campaigns. In responding to calls for improving sustainable operations, firms focus on providing environmentally friendly goods and services and improving their operations to reduce reputational damage while also gaining a competitive advantage.

2.8.4.6 Cost reduction/improve resource utilisation

The need to reduce production cost is considered a major driver for implementing sustainable practices (Walker et al., 2008). The conception of this is that firms embark on sustainable practices such as waste and pollution reduction to cut cost and improve the quality of their products and services. The use of whole life costing approach can lead to reduced expenditure. This is applicable to the O&G sector by making sure operations are free from environmental hazards that may result in a higher cost if anything goes wrong within the supply chain. Firms also adopt leaner sourcing strategies such as engaging in local procurement and greener transportation systems, to reduce transportation cost and environmental impact (Mena et al., 2014). It is, however, important to note that a focus on cost reduction can contradict sustainable practice goals (Walker and Jones, 2012). For instance, in a bid to achieve economic gains, firms can resort to using substandard products and services that are harmful to the environment and society. For this reason, firms are advised against prioritising economic gains when seeking sustainability objectives.

2.8.4.7 Gain a competitive advantage

The need to gain or maintain a competitive advantage is driving many firms into implementing sustainable practices. For instance, there is an assumption within the literature indicating a positive relationship between firms' involvement in excellent environmental protection practices and firms' competitive advantage (Giunipero et al., 2012; Yusuf et al., 2013). An assumption that the implementation of sustainable practices can help firms gain a competitive advantage, which can then lead to financial goals has significantly influence firms to implement SP practices. This approach is considered proactive due to the increasing pressure faced by firms to consider the impact of their operation on the environment and society in the face of realising other organisational goals, such as achieving economic gains. The adoption of sustainability practices results in regulatory compliance, risk management, business efficiency and market expectation, which can lead to a competitive advantage.

2.8.4.8 Improve environmental impact

Increase environmental concerns have led to the adoption and implementation of innovative approaches (Zhu et al., 2005). These approaches are targeted at minimising the undesirable impact of organisational activities on the environment. Being an aspect of the TBL, the environment constitutes a major public concern triggering some of the most confrontation debates across the globe. For example, incessant oil spillages, gas flaring and other forms of pollutions have drawn public attention to the negative activities of the O&G sector. This has made environmental issues an immediate concern for firms especially as they seek public acceptance. The extant SP literature argues that firms seeking to improve their environmental performance are likely to adopt SP practices (Walker et al., 2008). This is because firms have also realised that the management of their environmental performance goes beyond their organisational boundaries and involves other stakeholders, such as their suppliers, and customers in some cases. Put simply, just complying with environmental regulations cannot lead to improved environmental performance. However, having an environmental mindset contributes to a firm's TBL awareness, which is necessary to facilitate full sustainability initiatives needed to improve environmental performance.

2.8.4.9 Financial benefits

While the debate on whether the adoption and subsequent implementation of sustainable practices can lead to improving financial performances is still an open one, an assumption that it does lead to improving financial performance has compelled firms into adopting sustainable practices. Considerable numbers of studies have observed that the implementation of sustainable practices does influence the economic bottom line of implementing firms (Giunipero et al., 2012; Pullman et al., 2009). Financial benefits are considered a very important driver for implementing sustainable practices, especially regarding business organisations. For instance, efforts to improve the firm's environmental impact such as reducing waste can lead to savings in purchases and waste disposal exercises. Furthermore, firms with excellent sustainable practices are observed to have a good reputation and brand image, which means they have a higher market share as customers are likely to patronise such firms.

2.8.4.10 ISO 14001 Certification

ISO 14001 is a guideline for environmental management first launched by the International Organisation for Standardisation in 1996 and revised in 2004. As methods to manage the environmental impact of firms' operations evolve, the role of ISO 14000 especially ISO 14001, in promoting sustainable practices has remained outstanding in both practice and research (Heras-Saizarbitoria et al., 2011; Simpson and Sroufe, 2014; Yusuf et al., 2013). For a production firm, managing the environment involve designing processes, products, and services that are environmentally friendly. ISO 14001 is also argued to be very effective in simplifying the screening of suppliers in pursuing sustainability goals (Zsidisin and Hendrick, 1998). The influence of ISO 14001 and other related certifications have increase firms' environmental awareness and how the same can be addressed using sustainable practices. For instance, Walker and Brammer (2009) note that ISO 14001 is a key driver for adopting SP initiatives within the UK. With an initiative geared towards one aspect of the TBL already in place, firms are likely to embed an approach that considers all three aspects of the TBL. Correspondingly, sustainable practices extend to suppliers only when a focal firm has already implemented such practices and is certain of the benefits thereof.

2.8.4.11 Employee involvement

The role of employees in facilitating change within the organisational levels is observed within literature (Bodenhausen and Curtis, 2016; Raineri and Paillé, 2016). The need for employee involvement in realising sustainability targets is also observed within the extant literature (Hanna et al., 2000). For example, in Markey et al. (2016) employee participation is observed to be a major influence for addressing sustainability challenges. Similarly, Srivastava and Shree (2018) found that employee involvement in green initiative has a positive influence on firms' sustainability activities. Employee involvement is considered an important driver that can help firms actualise their sustainability targets. According to Grandia (2016), the behaviour of employees can have a major impact on the implementation of SP. It is argued that employees' commitment determines the level of a firm's SP implementation. To involve employees and gain their commitment, firms are encouraged to organised training programmes to increase sustainability awareness among employees (Aragão and Jabbour, 2017; Srivastava and Shree, 2018). This driver can be very helpful in

this research context since it is assumed there is lack of SP awareness especially in developing and emerging countries (Delmonico et al., 2018; Islam et al., 2017b; McMurray et al., 2014).

It is important to note that the influence these drivers have on firms can vary considerably, depending on the firm, location and stakeholders (Brammer and Walker, 2009; Grandia, 2016). However, these are some of the main drivers reported in the extant SP literature central to this research. The next subsection evaluates the barriers to SP practices.

2.8.5 Barriers to SP practices

Whereas there are forces driving firms to implement SP practices, there are also several barriers, hindering the adoption, implementation and advancement of SP practices. In Seuring and Muller (2008), several barriers to implementing sustainability initiatives were identified. Understanding the barriers to implement innovative approaches is crucial to overcoming implementation challenges. For this thesis, Table 2.6 highlights some of the key barriers (internal and external) to SP practices within the extant literature, which firms ought to address (depending on the firm) to successfully implement SP practices. In order words, the presence of these barriers can thwart the implementation of SP practices. Some of the barrier items highlighted here are considered drivers if present as discussed in the preceding sections. For example, top management support and commitment is a driver if present, and a barrier if absent in the implementation process. This is applicable in the case of government regulations and standards.

2.8.5.1 Cost of implementation

The cost of implementation has repeatedly been mentioned as a major barrier to implementing SP practices (Luthra and Haleem, 2015; McMurray et al., 2014). It is assumed that sustainability initiatives are very expensive for firms to adopt (Brammer and Walker, 2011). It is also assumed that sustainable products are generally more expensive in the marketplace. For example, the cost of environmentally friendly packaging is considered higher than traditional methods of packaging (Zaabi et al., 2013). The cost of implementing sustainability initiatives are huge, and the fact that the return on investment is not realised

immediately (Luthra and Haleem, 2015), makes it difficult for firms to buy into sustainable practices. However, it is argued within the literature that firms are becoming more aware of the impact of implementing sustainability initiatives, which could lead to environmental, social, economic and reputational benefits (Berns et al., 2009; Giunipero et al., 2012; Mena et al., 2014).

Table 2.6: Key barriers to SP practices

S/n	Barriers	Sources
1.	Cost of implementation	Brammer and Walker (2011), Giunipero et al. (2012), Hasselbalch et al. (2014), Islam et al. (2017b), McMurray et al. (2014), Walker and Jones (2012)
2.	Lack of top management support and commitment	Brammer and Walker (2011), Hasselbalch et al. (2015), Islam et al. (2017b), McMurray et al. (2014), Min and Galle (2001), Walker and Brammer (2009)
3.	Lack of sustainability standards and regulations	Giunipero et al. (2012), Min and Galle (2001), Zhu and Sarkis (2006)
4.	Lack of awareness	Hasselbalch et al. (2015), McMurray et al. (2014), Preuss, 2009, Walker and Brammer (2009)
5.	Unavailability of sustainable products	Hasselbalch et al. (2014), Islam et al. (2017b), McMurray et al. (2014), Walker and Brammer (2009)
6.	Lack of resources and capabilities	Hasselbalch et al. (2014), Islam et al. (2017b), McMurray et al. (2014)
7.	Lack of supplier commitment	Walker and Jones (2012), Walker et al. (2008)
8.	Firm size	Walker and Jones (2012), Lee (2008)
9.	Inadequate training of staff	Hasselbalch et al. (2015), Islam et al. (2017b)
10.	Misalignment of short and long-term goals	Giunipero et al. (2012), Mena et al. (2014)

2.8.5.2 Lack of top management support and commitment

The role top management employees play in making strategic organisational decisions cannot be overemphasised. SP implementation is strategically important to the firm, which means, top management commitment is required to accomplish SP implementation. Lack of top management support and commitment is viewed as a leading barrier to implementing

SP practices (Islam et al., 2017b). Presumably, and rightly so, this barrier has a major impact on other barrier items, such as inadequate training of staff and lack of resources and capabilities (Zaabi et al., 2013). This show how important the commitment and support of senior employees mean to the SP implementation process.

2.8.5.3 Lack of sustainability standards and regulations

As discussed earlier on, the presence of sustainability standard and regulations can drive firms toward implementation. Conversely, the lack of it is considered a barrier to SP implementation. The extant literature, especially those from developing and emerging countries, has identified the lack of sustainability standards and regulation as a key barrier to implementing SP practices. The complex nature of the supply chain is worsened by the involvement of different parties from different locations. This situation introduces different sustainability regulations and standards into the supply chain making compliance and monitoring difficult for focal firms (Giunipero et al., 2012). However, government regulations and standards are very influential in exerting pressure on firms to adopt sustainability initiatives (Tay et al., 2015).

2.8.5.4 Lack of awareness

The lack of awareness of SP practices is considered a significant barrier to its implementation (McMurray et al., 2014; Preuss, 2009). Lack of awareness means firms would continue to use traditional and unsustainable methods of operations, which will also hamper the implementation of sustainable practices. To overcome this, firms can promote SP awareness by providing training to employees where SP challenges can be discussed in relation to the firm's needs and concerns (Dawson and Probert, 2007; Erridge and Hennigan, 2012). In addition, the government can promote awareness by investing in sustainability initiative, while NGOs and other stakeholders can promote awareness through sustainability campaigns demanding firms to be more responsible in their operations (Delmonico et al., 2018). Generally, there is a strong awareness of environmental issues in the country under study, due to the incessant environmental degradation activities of the O&G sector. However, the environmental conservation groups lack the willpower, finance and

government backing needed to address sustainability challenges in the country under study (Omolola, 2013).

2.8.5.5 Unavailability of sustainable products

The unavailability of sustainable goods/services has been observed as a major barrier to SP practices. For example, the study of Walker and Brammer (2007) which focused on the UK a developed country identified the non-availability of sustainable products as a barrier to implementing SP practices. Recent SP studies from developing countries also corroborate this finding (Hasselbalch et al., 2014; McMurray et al., 2014). In particular, Hasselbalch et al. (2014) found the unavailability of sustainable goods/services to be one of the main barriers to SP in their study. This goes to show how unsustainable the operations of many firms are around the world. Mena et al. (2014) noted that not taking a TBL approach to production activities have several consequences, for instance, damage to corporate reputation, government sanctions for breaching regulations. According to Islam et al. (2017b), procurement directors/managers must do more to balance strict environmental and social criteria and provide support to assist suppliers in addressing sustainability challenges.

2.8.5.6 Lack of resources and capabilities

The financial challenges firms face appears to have a negative impact on the resources devoted to sustainability initiatives. The unavailability of resources and capabilities have remained a dominant barrier to the implementation of SP as firms struggle to meet financial targets. Resources and capabilities in this context would include human capital and skills, knowledge, technical expertise, information technology or even finances needed to implement SP practices. According to McMurray et al. (2014), this barrier is statistically more significant for SMEs in comparison to large firms. Suggesting that SMEs are more under financial pressure to fund or invest in capabilities that can facilitate the implementation of sustainability initiatives. However, the presence of this barrier, which is observed in firms of all sizes, has made the implementation of SP practices challenging (Hasselbalch et al., 2014; Islam et al., 2017b; McMurray et al., 2014). Firms within the upstream O&G sector are generally large. However, infrastructural and technological capabilities needed to produce environmentally friendly goods are very expensive and scarce, making the implementation

of SP practices almost unpractical (Yusuf et al., 2013). This, therefore, indicates the need for firms to commit more resources on the issues of sustainability and provide staff with relevant training to implement SP practices.

2.8.5.7 Lack of supplier commitment

The involvement of suppliers to achieve sustainability objectives is stress across the extant literature. According to Hasselbalch et al. (2014), a holistic approach involving every stakeholder including suppliers is needed to operationalise SP practices. Conversely, the lack of suppliers' commitment to SP practices implementation is also been identified as a barrier. This situation suggests that even where sustainability initiatives are being implemented by buying firms, suppliers are seen to be a stumbling block, mainly due to a lack of commitment to sustainability objectives. This could be due to several reasons, i.e. resistance to change, lack of awareness, expertise or even financial resources needed to implement SP practices. To overcome this barrier, firms are urged to promote awareness of sustainability practices by providing funding, training and technical support to suppliers when needed. The inclusion of sustainability issues in the supplier evaluation process can also help in this regard (Lee et al., 2009). In addition, suppliers are encouraged to commit to sustainability practices to mitigate environmental and social challenges by complying with child labour law, operate in a safe working environment, design product that can be reused or recycle (McMurray et al., 2014; Walker and Jones 2012; Walker et al., 2008).

2.8.5.8 Firm size

The role of firm size in adopting SP practices is observed within the extant literature (Min and Galle, 2001; Yook et al., 2018). For example, in Lee (2008) firm size was considered to have an impact on SME participation in SP practices. Firm size is noted to be a facilitator of SP practices to large firms because it is assumed that large firms are ecologically conscious and have the resources as well as operational and technical capabilities to implement SP practices (Walker and Jones, 2012). Whereas size is a facilitator to large firms, it is observed to be a barrier to smaller firms as they struggle to implement SP practices due to lack of resources and capabilities. To address this, Min and Galle (2001) opine that smaller firms should adopt different SP strategies from those adopted by large firms. They suggested that

smaller firms could outsource their sustainability initiatives to more competent firms who have the resources and capabilities to implement SP practices.

2.8.5.9 Inadequate training of staff

The need to equip employees with the skills necessary to mitigate sustainability challenges cannot be overemphasised. Having the right skills and information needed to implement SP practices can be of huge benefits to any firm planning to initiate such practices. Conversely, the inadequate training of staff can have an adverse effect on SP practices, making it one of the main barriers to implementing SP practices. Sustainability has been an innovative initiative focus on mitigating environmental and social issues in conjunction with economic issues, firms have little or no experience on how best to implement it. Adopting SP practices is one thing, but implementing it is another. The literature argues that firms must support the adoption of SP practices with training and development of staff to realise significant improvement. The importance of staff training has been observed in several SP studies within the literature (Hasselbalch et al., 2015; Islam et al., 2017b; McMurray et al., 2014). In particular, Delmonico et al. (2018) proposed that extensive training on sustainability management is vital for implementing SP practices.

2.8.5.10 Misalignment of short and long-term goals

The lack of information and understanding of what sustainability entails has led to the inappropriate coordination of SP implementation. According to Giunipero et al. (2012), there is a lack of common understanding, goals and measurement techniques on sustainability initiatives between firms. It is generally assumed that sustainability initiatives are long-term oriented since it is anticipated to produce long-term positive effects (Brammer and Walker, 2011; McMurray et al., 2014). However, the high cost of implementing SP practices requires that a manager must have concrete justification for implementing such initiatives. In this sense, benefits of investing in sustainability initiatives should be examined in comparison to other short-term investments mostly valued by firms due to their apparent immediate return on investment (Yusuf et al., 2013).

The above-noted barriers validate the notion that most SP barriers are internal to the firm rather than external (George et al., 2016; Islam et al., 2017b). Although this is not an exhaustive and exclusive list of barriers to SP, they represent key findings from both the private and public sectors. Whereas SP barriers in private and public sector firms are similar (Walker et al., 2008), this observation is refuted by Hasselbalch et al. (2015) who argued that private sector barriers are not entirely applicable to the public sector because the legal and economic environment restraining private sector firms differs from that restraining public sector firms. This view was also observed in Zhu and Sarkis (2006) where it is found that barriers, drivers and practices differ across firms and industries. For example, the cost of implementation can be a barrier to *company 'A'* but not to *company 'B'*. In addition, some industries are well regulated, especially in developed countries. In such cases, regulation cannot be perceived as a major barrier to SP practices (Hassini et al., 2012; Hoejmose et al., 2012; Walker et al., 2008). With these noted variations to SP practices, this research seeks to identify the drivers and barriers to SP within the Nigerian O&G sector to provide a context view analysis. Through this approach, the researcher can develop a clear opinion of the possible drivers and barriers, facilitating and deterring the adoption, implementation and advancement of SP practices within the sector under study.

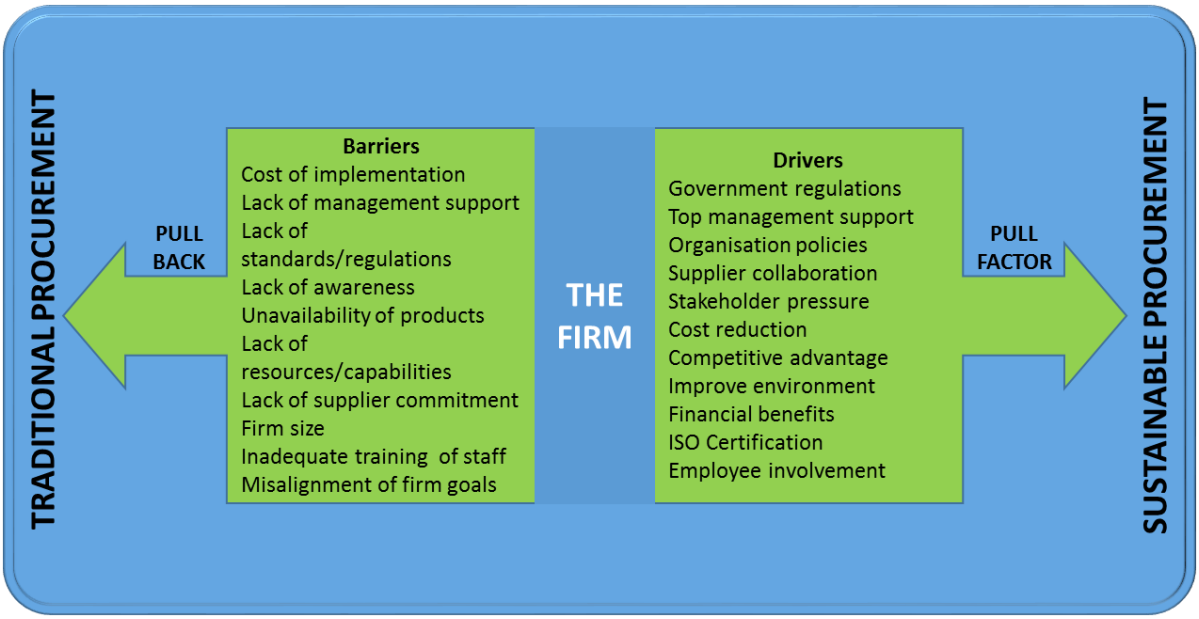

Figure 2.3: Summary SP barriers and drivers' model
Source: Author

It is clear from the above discussion that the implementation of SP practices is influenced by different factors, which comprises both drivers and barriers as shown in Figure 2.3. In addition to the drivers highlighted in Figure 2.3 sustainability initiative, such as the United Nations Global Compact (UNGC) initiative is also noted to be a very crucial institutional driver for implementing sustainability practices.

2.8.6 United Nations Global Compact Initiative

The UNGC initiative is a voluntary programme officially launched in July 2000 by the United Nations for governments, firms, academic institutions, NGOs and other stakeholders to interact, network and promotes its values and principles (Runhaar and Lafferty, 2009). The UNGC initiative focuses on mitigating challenges, such as environmental degradation, human rights, labour rights and corruption. It also encourages and improves the transparency and accountability of participating firms (Cetindamar and Husoy, 2007). The UNGC initiative is argued as one of most striving and fruitful institutional frameworks for businesses to embrace not just good and ethical practices, but also significant aspect of sustainability practices, such as environmental sustainability, all of which are addressed within the dimensions of SP practices (Fussler et al., 2017; Runhaar and Lafferty, 2009; Vormedal, 2005). The UNGC initiative is designed by the United Nations as a normative governance mechanism to aid businesses in interacting and learning about how they could improve their sustainability performances.

The UNGC initiative set out 10 principles as shown in Table 2.7, realised from the Universal Declaration of Human Rights, the International Labour Organisation's Declaration on Fundamental Principles and Right at Work, the Rio Declaration on Environment and Development, and the United Nations Convention Against Corruption. These 10 principles are intended to normatively facilitate the implementation of sustainability practices across the business operations of participating members to realise sustainable development and social justice (Runhaar and Lafferty, 2009; Vormedal, 2005).

Table 2.7: The Ten Principles of the UN Global Compact

Aspects	Principles
Human rights	❖ Businesses should support and respect the protection of internationally proclaimed human rights; and ❖ make sure that they are not complicit in human rights abuses.
Labour conditions	❖ Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining; ❖ the elimination of all forms of forced and compulsory labour; ❖ the effective abolition of child labour; and ❖ the elimination of discrimination in respect of employment and occupation.
Environment	❖ businesses should support a precautionary approach to environmental challenges; ❖ undertake initiatives to promote greater environmental responsibility; and ❖ encourage the development and diffusion of environmentally friendly technologies.
Anti-corruption	❖ businesses should work against all forms of corruption, including extortion and bribery.

Source: UNGC (2016)

Being a voluntary initiative, to ensure legitimate implementation of the 10 principles, participating business organisations are required to produce an annual Communication on Progress (COP) report containing efforts made to implement and support these principles to preserve their membership. Whilst non-business organisations participants produce an annual Communication on Engagement (COE) report containing details of how they have promoted the course of the UNGC initiative. This is expected to reduce *greenwashing* risks, as some organisations could use participation to gain legitimacy and not actually implement the said principles. This perspective is held in the existing literature, which claimed that the UNGC initiative is used by participants who do not actually implement the principles highlighted in table 2.7 to gain legitimacy falsely (Sethi and Schepers, 2013).

However, steps have been taken by the UNGC initiative in the above direction. For example, excluding organisations alleged not to be adhering to its principles or values from its register (Eijk et al., 2018; Rasche et al., 2017), thereby strengthening the values of the UNGC. This notwithstanding, the use of alternative approaches, other than law (for example, normative

and mimetic institutions like the UNGC) is encouraged within the existing literature considering the lapses of the law in promoting sustainability practices (Lau et al., 2017; Musa et al., 2013; Perez-Batres et al., 2011). The UNGC initiative as an interactive and collaborative programme of corporate stakeholders, is, therefore, considered as a plausible means of creating a positive perspective to tackle sustainability challenges and fill the gaps created by the law (Lau et al., 2017).

The literature as discussed above confirms that drivers pull firms toward SP implementation, whereas barriers pull firms backwards towards more traditional procurement approaches. The impact of these factors can vary significantly depending on firms' involvement and the dynamics of the market in which they operate. With these dynamics in mind, firms ought to be mindful in identifying their short and long-term sustainability targets and the drivers and barriers to achieving these targets.

The next section reviews the literature in relation to the O&G sector sustainability, looking specifically into the adoption and implementation of SP practices within the Nigerian O&G sector.

2.9 The Oil and Gas sector sustainability

This section of the literature review discusses issues of sustainability in relation to the O&G sector in general and thereafter focus on the context of this research, i.e SP practices in Nigerian O&G sector. Efforts made to integrate sustainability across the sector including the challenges encountered are also highlighted. The use of SP practices to mitigate corporate sustainability challenges through suppliers and contractors involvement is also addressed. This is crucial in order to develop a robust conceptual framework in this study. Although an attempt has been made to conceptualise SP practices previously, its application and operationalisation within the O&G sector have not been explored in this research. Therefore, this section seeks to augment previous chapters in establishing the conceptual framework.

There is a huge increase in O&G production in the last few years owing to increase in demand, human development, as developing countries strive to reach their full potentials and technological improvements used to access difficult oil reserves. Although O&G production has been very unsteady in Nigeria due to several issues (Uwakonye et al., 2006), a steady increase in production has been witnessed in other parts of the world. For instance, crude oil production in the United States surge from 2.4 billion barrels in 2012 to more than 3.4 billion barrels in 2017 (Bennion and Mead, 2013; U.S. Energy Information Administration, 2018). The impact of the O&G sector is also felt economically, accounting for approximately $1.2 trillion in gross product every year and providing over 9.3 million substantive posts in the United State alone (Ngene et al., 2016). Similarly, in Nigeria, there is a huge growth in revenue generation from the O&G sector, which accounts for about 95% of the country's exports. For example, in 2014 the sum of ₦1,016,781,027,484.65 ($2,810,728,465.52) was generated from the O&G sector by the Nigerian government as against N698,420,674,729.39 ($1,930,672,207.98) generated in 2010.

2.9.1 Challenges of the O&G sector

Whereas the O&G sector is classified as an economic generator in many parts of the world, this notion is contested base on the notion that O&G exploration, production and consumption of its products are unsustainable (Ahmad et al., 2016a; Ngene et al., 2016). However, it is also a general notion that no modern-day society can survive without O&G products, which is argued to be the second largest resource consume in the world (Abubakar, 2014). The daily high dependence on O&G products around the world, therefore, places immense pressure on the sector's players; intertwine one way or the other in a very complex supply chain. Parallel to other supply chains, the O&G supply chain is even more complex in nature mainly owing to the nature of O&G projects, which involves far more actors (Olsen et al., 2005). Due to the complex nature of the O&G supply chain, Olsen et al. (2005) suggested the use of contracts and governance mechanism for managing complex procurement activities. According to them, the governance mechanism, such as trust, incentives and authority all play significant roles in O&G project management.

Moving further, different views have been held in line with changing the business environment. For example, the need for firms to change from their traditional production and consumption approaches into innovative approaches that consider the natural environment and society has been emphasised within the literature (Abdalla and Siti-Nabiha, 2015; Nwagbara, 2013; Stead and Stead, 1994). Although cost control and project schedules are classified as some of the main challenges of the O&G sector, several studies have commented on the poor environmental and social performances of O&G activities in recent times by suggesting the adoption of innovative approaches within the sector (Ahmad et al., 2016a; Ngene et al., 2016; Silvestre, 2015). From an institutional perspective, environmental and societal wellbeing should be accorded more attention by the O&G sector considering its hazardous nature, which is said to have various negative impacts on inhabitants (George et al., 2016; Idowu and Lambo, 2018). This situation has resulted in the formulation of different policies and regulations in different parts of the world to help prevent and mitigate the negative impacts of exploration and production activities of the sector. The emergence and promotion of the sustainability concept by both government and non-government agencies have also exposed the O&G sector to the world. This is because the O&G sector is particularly environmentally sensitive in nature and noticeable to the media.

Growing public awareness and scrutiny of the sector's activities have resulted in many unpleasant demonstrations and campaigns (Silvestre et al., 2017; Uwakonye et al., 2006). These demonstrations and campaigns have exerted pressure on the sector to recognise the need to move towards a more sustainable operation (Abdalla and Siti-Nabiha, 2015), as governments and non-government organisations continue to foster ways in which improvements can be made. Consequently, the O&G sector has embarked on different innovative sustainability projects, including water and carbon technology with the intent of generating renewable energy. However, the high cost of generating renewable energy has led to a fall in profit for some O&G firms championing the campaign for renewable energy. This development has prevented affected firms from investing in high capital projects that can lead to the generation of renewable energy (George et al., 2016). Nevertheless, the need to safeguard the environment and society is significant and crucial for the functionality of the sector considering eminent climate change issues.

2.9.2 Sustainability measures within the O&G sector

Sustainability issues within the O&G sector supply chain have not received much attention when compared to the manufacturing sector. This is despite the significant role the O&G sector plays in terms of economic and social activities (Ahmad et al., 2016b). According to Saad et al. (2014), supply chain issues within the O&G sector were initially classified as minor issues until recently when firms within the sector realised that bulk of their operational spends go to the supply chain. In addition, firms within the sector have come to realise that the success of projects is linked to how well procurement and supply chain activities are managed. These new discoveries by firms within the sector popularise the procurement function and supply chain system. According to Fossgard-Moser (2003), engaging in sustainable practices can be of benefit to firms because such practices can lead to operational and reputational benefits while boosting communities' wellbeing through local and national economy. See also Bose and Pal (2012) where it is argued that the adoption of sustainable practices can lead to instant gains in stock prices. Other benefits of sustainable practices are documented across the sustainability literature. For instance, the adoption of green practices can lead to increased competitive advantage and innovative capabilities (Yusuf et al., 2013).

An article on SP practices within the O&G sector indicates a substantial level of awareness of the concept, yet its adoption has raised plenty of criticisms (Rice, 2009). According to Rice (2009), the sector must address issues concerning sustainability policies. Particularly, the study stress that sources of raw materials and products must be assessed by the sector to determine their impact on the supply chain. Activities of the procurement function such as this, if not handled responsibly can lead to dire consequences that could include environmental, economic, social and reputational damages. For instance, the BP oil spill of April 20, 2010, in the Gulf of Mexico, which claimed the lives of 11 people, is arguably linked to failings in managing the activities of the supply chain (BBC, 2011).

There are numerous examples from other sectors to confirm the need for firms to attach more importance to the source of their products. For example, the case of Toyota recalling

about 7.5 million vehicles (Evans and MacKenzie, 2010) and the case of Mattel, where failings in the supply chain also led to the recall of its products (Kumar and Schmitz, 2011; Rice, 2009). It is, therefore, significant that firms know the source of their raw materials and other finished goods and put in place measures to check and evaluate their suppliers' compliance levels to manage supply chain risks and their environmental and social impacts (BSI, 2010).

The recent trend in supply chain management that involves sustainability correspond with the climate change *"Paris Agreement"* which did not only call for the commitment of States but also the commitment of non-state actors to cut or help cut their greenhouse gas (GHG) emissions (United Nations, 2015). The O&G sector is not left out in this commitment as the world tries to find a long-lasting solution to climate change issues (George et al., 2016; United Nations, 2015). Although the positive impact of the O&G sector to the world is glaring as its products are used extensively for economic and social activities, much attention is concentrated on the negative impact of its activities, which obviously requires drastic measures (George et al., 2016).

To remedy the above situation, the O&G sector has adopted several sustainability approaches as hinted earlier (Infante et al., 2013). For example, environmental impact assessment programmes, CRS programmes, sustainable production and consumption, and other sustainability practices, have been observed within the O&G sector. In addition, firms within the O&G sector had also taken several sustainability measures, like cutting of GHG emissions, reducing waste, reducing carbon footprint, reducing air pollution, reducing the volume of used resources, for example, water. To further strengthen their environmental commitment, firms within the O&G sector rely heavily on environmental certification, such as ISO 14001, of their facilities, including those of their suppliers and contractors (Al Suqri et al., 2018; Mustapha et al., 2014) and implemented the UNGC principles (Dura et al., 2017). In most cases, ISO 14001 certification is a requirement that must be met in order to secure contracts within the O&G sector. On the social side, firms have engaged the UNGC principles and adopted measures to combat infectious diseases in communities and undertaking entrepreneur programmes to improve societal well-being (Alabi and Ntukekpo, 2012;

Chevron, 2015; Dura et al., 2017; ExxonMobil 2015; Infante et al., 2013; Schneider et al., 2013; Shell Global, 2016; Total, 2015).

However, there is a general perception that sustainability efforts made within the O&G sector were initially on environmental issues with social issues only been considered recently (Yusuf et al., 2013), through the implementation of CSR practices (Ahmad et al., 2016a; Raufflet et al., 2014). This perception is in line with the study of Schneider et al. (2013) which assessed sustainability practices within the O&G sector and found evidence of awareness and more commitment to environmental sustainability issues compared to social issues. Although there is increased awareness and investments on sustainability issues in the O&G sector, these efforts are not intensively implemented neither do they reflect on the activities or operations of the sector. This situation has led to considerable criticism and backlash from the society, government agencies and non-government agencies who have accused firms within the sector of 'greenwashing' (George et al., 2016).

There are several challenges associated with sustainability practices. For example, bureaucratic institutional frameworks, attitudinal and financial challenges (Edomah, 2016), lack of capabilities, availability of instruments or processes (Schneider and Wallenburg, 2012), monitoring of new risks and adaptation issues (Crespin-Mazet and Dontenwill, 2012) are amongst some of the challenges faced by firms. As well as challenges, the need for inter-organisational cooperation and collaboration between a focal firm and its stakeholders, especially its suppliers, is considered a critical success factor of implementing sustainability practices. The O&G sector adopts different relationship approaches as observed from the existing literature. While the sector has experienced positive moves toward innovative procurement approaches, it is also evident that the traditional methods of procurement are still prevalent within the sector. This is not surprising since a single procurement method cannot fit or be beneficial in all transactions especially in the O&G sector where a huge percentage of materials, equipment, machinery, goods, works and services are sourced and outsource.

In a study of suppliers' sustainability carried out by Gimenez and Tachizawa (2012), its findings suggested that collaborative practices between firms and suppliers could impact positively on both environmental and social aspects of the triple bottom line. This finding supports the extant literature on the essential role of collaboration between firms and their suppliers in sustainability initiatives. Whereas evidence suggests there is the use of collaborative relationship style between operators, contractors, subcontractors and suppliers within the O&G sector, such efforts have been argued as a replication of other sectors' procurement approaches with no relation to sustainability (Mohammad, 2008; Saad et al., 2014; Sepehri, 2013). This is apparent within the O&G sector, even though the extant supply chain literature suggests that supply chain can facilitate collaboration, sustainability and innovative performance (Silvestre, 2015).

Focusing on the O&G sector supply chain, Yusuf et al. (2013) in their study suggested that many firms lack the financial capability to implement sustainability measures. This is in line with the extant SP literature where the cost of implementation is cited to be a key barrier to SP implementation (Brammer and Walker, 2011; Kalubanga, 2012; Lund-Thomsen and Costa, 2011; McMurray et al., 2014). George et al. (2016) also investigated the barriers and enablers of sustainability integration into the performance management systems of O&G firms (Ekiugbo and Papanagnou, 2017). According to George et al. (2016), different factors act as enablers and barriers to sustainability integration into the performance management systems. For example, lack of understanding of wider sustainability issues, lack of structure for sustainability, lack of industry experience, lack of knowledge about sustainability and lack of systems performance evaluation and target setting processes were among the barriers revealed in their study. Whilst clear organisational vision and mission, the establishment of a formal sustainability framework, formation of sustainability units and champion groups, increasing awareness and commitment to HSE issues, are observed to be among the enablers of sustainability integration (George et al., 2016). These barriers and enablers were classified into three categories, e.g. Cognitive, organisational and technical factors, which they consider crucial to sustainability integration.

The factors noted above are mainly internal to the organisations, which, therefore, suggests that firms, with the right attitude and zeal, can overcome these barriers and expedite the formulation of enablers that can help them implement SP practices. The need for commitment and preparedness on the part of firms within the O&G sector has been observed in the literature. According to Ahmad et al. (2016a), identifying the internal resources and capabilities needed for implementing sustainability practices is important to address sustainability challenges. It is argued that commitment towards SP practices would get firms prepared for implementation. Commitment can be achieved through, for example, support and leadership accountability from top management teams, developing a corporate culture that encourages sustainability practices, and a willingness to undertake business activities in a transparent manner (Ahmad et al., 2016a). This is unquestionably in line with the literature, which stressed on the commitment and support of top management as a key driver of sustainability implementation (Crespin-Mazet and Dontenwill, 2012; Romans, 2017; Walker and Brammer, 2009; Walker et al., 2008). The literature also posits that commitment and leadership support from top management teams are crucial in developing strategic direction and corporate culture required for stimulating SP implementation. For instance, Ahmad et al. (2016a) in their study, found that firms with the right corporate culture are more likely to commit to innovative strategies.

Furthermore, Ahmad et al. (2016a) found firms' preparedness towards risk management, cross-functional integration, as well as, performance management practices to have a stronger influence on the level of SP implementation, compared to firms' commitment and preparedness towards sustainable practices. This finding not only revalidate the need for true sustainability, which is meant to cut across all the functions of a firm, its suppliers (first, second and third tiers), and other key stakeholders, but also indicates that SP can be used as a risk management tool.

Looking further on the role of factors, George et al. (2016) also stressed the major role played by internal and external factors in driving firms toward SP implementation. They noted that due to normative, mimetic and coercive isomorphism, which arises from institutional pressure, firms have taken steps to implement sustainability practices. In

addition, they noted that external factors such as institutional regulations have help shape management decision making towards SP implementation. Ahmad et al. (2016b) discussed the influence of regulatory pressure and other factors in driving sustainability implementation within the O&G sector. See also Abdalla and Siti-Nabiha (2015) where it is observed several institutional pressures, both internal and external, drive sustainability implementation.

2.9.3 SP practices within Nigerian O&G sector

The Nigerian O&G sector, as already noted in this research, contributes immensely to the Nigerian economy as it accounts for about 83 per cent of the nation's revenue (Amujo et al., 2015). Whilst this sector has created wealth to Nigeria as a nation, it has led to awful results on aquatic and domestic animals, the environment, and humans thereof (Ako, 2012; Amujo et al., 2015; Ekiugbo and Papanagnou, 2017; Odoeme, 2013). There are issues of health and safety, oil spillage, gas flaring, salinization, environmental degradation, air pollution, corruption, and other problems resulting from the activities in the Nigerian O&G sector (Ambituuni et al., 2014; Ihua, 2010; Shell, 2014). In response to these challenges, the Nigerian government has rolled out several environmental policies and regulations, as well as economic and social improvement policies to help regulate the activities of the sector to reduce its harmful impacts and stimulate economic and infrastructural development in the country. For instance, the Petroleum Act, 1969; Environmental Impact Assessment (EIA) Act of 1992; National Environmental Standards and Regulations Enforcement Agency (NESREA) Act of 2007; Oil in Navigable Waters Act 1968; National Oil Spill Detection and Response Agency (NOSDRA) Act 15 of 2006; Environmental Guidelines and Standards in the Petroleum Industry in Nigeria (EGASPIN) 2002 and the Nigerian Content Act 2010.

Efforts of the Nigerian government has been criticised and considered insufficient and weak when compared to international standards use for regulating the O&G sector (Odoeme, 2013; Orji, 2013). Besides the weak insufficient laws and regulations, implementation and monitoring are also notable challenges in the Nigerian O&G sector (Idowu and Lambo, 2018; Kadafa, 2012). These failings have been linked to weak and ineffective institutions, regulatory regimes, lack of qualified personnel, and high levels of corruption within the

behemoth firms' structure in the sector, which would connive with government officials in covering up their illegal acts (Kadafa, 2012; Musa et al., 2013; Nwapi, 2015). While these are notable issues within the Nigerian O&G sector, innovative approaches and techniques to mitigate these issues are however scarce. Though there are empirical research on the environmental aspect and CSR in Nigeria and the O&G sector in particular (Ako, 2012; Amujo et al. 2015; Ihugba, 2012; Ite, 2004), SP remains under-researched in the Nigeria O&G sector and region (Adebayo, 2015). To the best of the researcher's knowledge and understanding, there is a paucity of research, which has thoroughly and exclusively examined SP practices within the Nigerian O&G sector. This justifies the aims of this present research.

In addition, a *'sustainable procurement or SP'* search carried out in *'Scopus'*, a prominent database with extensive coverage of sustainability, supply chain, procurement, management and business journals (Ahi and Searcy, 2015), returned several results but none looked specifically into the Nigerian O&G or petroleum sector. However, while this does not rule out the possibility of a different outcome from other databases, the researcher posits that it would be very limited. This is because studies of sustainability practices within the O&G sector supply chain, in general, are rare (Ahmad et al., 2016a; Musa et al., 2013; Yusuf et al., 2013). Notwithstanding, some environmental investigations have been conducted within the Nigerian O&G sector, including analysis of policy frameworks to improve the growth of sustainable energy production in the country.

The study of Emodi and Boo (2015) reviews the status of energy resources and policies in Nigeria and found that energy efficiency rate in Nigeria is way below global standards. They proposed several policy options that can be implemented within the O&G sector to help the Nigerian state achieve sustainable energy development. For example, imposing suitable and effective penalties to discourage gas-flaring, policies to encourage foreign direct investment in renewable energy, and diversification of oil export. Extending the need for sustainable energy development in Nigeria, Edomah (2016) identified some key policy barriers to sustainable energy development in Nigeria that can be addressed. In keeping with this present research, legal and regulatory barriers, cost and pricing barriers, and market performance barriers are noted. According to Edomah (2016), these barriers, which range

from lack of capital funding, lack of access to credit, unfavourable pricing regulations, to lack of capability and skills, can be address through effective policies.

Kadafa (2012) carried out an investigation into the environmental impact of the Nigerian O&G sector. According to Kadafa (2012), the activities of Nigerian O&G sector has resulted in awful environmental degradation and loss of ancestral homes, mainly due to oil spillages and gas flaring which persist in the sector. This situation according to Musa et al. (2013) will render sustainability efforts of the sector inadequate and insignificant. Proposing methods to remedy the oil spillage situation that has resulted in contaminated lands and waters, Zabbey et al. (2017) suggested the use of several techniques, categorised under three approaches, namely, physical/mechanical remediation approach, chemical remediation approach and biological remediation approach. Zabbey et al. (2017) also stress the need for implementing suitable policies and regulations that can be sustained to ensure effective and efficient remediation of the affected area.

The work of Fossgard-Moser (2003) is one of the first to examine how the O&G sector can use its supply chain to achieve sustainable economic development within their area of operations. Firms can achieve this by increasing local employment and local procurement, an exercise central to SP practices (Walker and Brammer, 2009; Fossgard-Moser, 2003). However, in the Nigerian context, several factors are observed to hinder this process. For example, lack of skilled workforce, suppliers and sustainable materials all impairs the implementation process (Fossgard-Moser, 2003). Similarly, Vaaland et al. (2012) in their study also observes that lack of funds, capability, skills and competence on the part of contractors and suppliers impairs sustainability implementation. In addition, Vaaland et al. (2012) find that weak legal infrastructure, weak financial sector, low level of support from both IOC and government, weak managerial competencies, and low level of trust all impairs the implementation of sustainability practices within the Nigerian O&G sector. Of all these factors, the ‘low level of trust’ seems rather interesting especially since some of the rest factors have somewhat been discussed. Trust is argued to be a key critical success factor of strategic cooperation and collaboration required to operationalise SP practices (Paulraj, 2011; Wittstruct and Teuteberg, 2012).

As already hinted, aspects of SP practices have been examined in the Nigerian O&G sector. For example, a CSR study conducted in the Nigerian O&G sector by Musa et al. (2013) confirmed the sector's awareness and implementation of CSR practices and its benefits thereof. This study also confirmed that CSR has been widely implemented by the major players within the sector. However, Idowu and Lambo (2018) argued that CSR practices of firms within the Nigerian O&G sector only focus on peace and security within their area of operations. Idowu and Lambo (2018) are of the view that broader social issues should be addressed to ensure an effective CSR practice. This contradicts the views of Ite (2004), who argued that there are considerable CSR efforts within the Nigerian O&G sector, despite the government failure to create an enabling environment for CSR practices. In addition, an empirical study of Chevron's CSR practices revealed mixed findings in terms of the satisfactory level of host communities (Alabi and Ntukekpo, 2012).

From the above discussions, it is right to assume that CSR has been instrumental to the implementation of sustainability practices within the Nigerian O&G sector. What then is CSR *(corporate social responsibility)*? CSR is a concept which originated from *"social responsibility"* and has been perceived and interpreted in different forms (Ameashi et al., 2006; Ihugba, 2012). For example, it is viewed as firms' ability to consider ethical, social, legal and philanthropy responsibilities alongside economic responsibilities; a proactive and voluntary initiative adopted by firms to satisfy stakeholders' needs. It is also noted that CSR involves firms adhering to regulations, acting morally and justly and contributing to the environmental, economic, community and staff development (Moir, 2001). The tenets of CSR according to the extent literature includes but not limited to – environmental, human rights, labour practices and decent work, societal as well as product responsibility. Although these reflect some of the dimensions of SP practices, SP practices are broader and extend to suppliers and other stakeholders as highlighted in Appendix 1.

Whilst CSR has played an important role in promoting sustainability practices, especially the implementation of some aspects of SP practices across the Nigerian O&G sector, it mainly focuses on the socio-economic elements of sustainability. For instance, most CSR efforts

recorded are the provision of potable water supply, electricity supply, healthcare and educational facilities including scholarships, and development of roads for host communities (Ameashi et al., 2006; Ihugba, 2012; Musa et al., 2013). This does not reflect true SP practices, which consider broadly the sourcing strategies of firms, product stewardship, environmental impacts, the safety of work environment, diversity issues, sourcing from minority/women-owned enterprises, the need to support small and local suppliers and so on. The inadequacies of CSR practices in the Nigerian O&G sector in realising fruitful sustainability performances have been observed in the literature. For example, see Ihugba (2012), who suggested the enactment of CSR practices as a compulsory regulation to help achieve sustainability goals.

The above synopsis of the sustainability literature as it relates to the Nigerian O&G sector placed considerable emphasis on the need for clear policies and regulatory frameworks, support and commitment and the need for financial funding that could aid sustainability implementation. This corroborates the study of Ambituuni et al. (2014), which examined the laws and regulations governing the Nigerian O&G sector and found poor governance structure, conflict and overlaps of institutions and laws, inadequate funding as the main factors hindering sustainability implementation. Commenting on the significance of SP, Adebayo (2015) noted that the adoption of an all-inclusive SP policy could lead to sustainability practice in the supply chain of any industrial sector. This is mainly applicable to the Nigerian O&G sector where most of its activities are done on a joint venture agreement basis with the government. It is therefore not wrong to assume that the government with its position can, coercively or mimetically influence the O&G firms in adopting SP practices. However, this is not the case, as evidence in the literature (Anejionu et al., 2015).

Although some aspects of SP practices are prevalent within the Nigerian O&G sector as noted above, it is important to integrate SP practices as a policy into the buying process with a triple bottom line approach to achieve good results (Dawson and Probert, 2007). The Nigerian government can in this sense, enact effective laws, policies and regulations to encourage the implementation of SP practices as a business requirement that should be adhered to within the Nigerian O&G sector (Ihugba, 2012). While efforts such as the

implementation of local content development Act to help stimulate and leverage the Nigerian economy are commendable, more work still needs to be done by the Nigerian government because there seems to be lack of appropriate policies, standards, industry guidelines and legislative frameworks to aid the implementation of SP practices within the Nigerian O&G sector.

The literature notes that some major players in the Nigerian O&G sector, such as, NNPC, Shell, Total, Chevron, Mobil, Forte Oil and many others, have some sustainability and CSR programmes in terms of sustainable community development and environmental impact assessment programmes (Chevron, 2015; Fossgard-Moser, 2003; NNPC, 2015; Shell, 2014). Although programmes like this can influence SP practices (Walker and Jones, 2012), they cannot be substituted for SP practices themselves, which encompass much more. SP practices take the form of suppliers' involvement and designing products that are environment-friendly as well as providing social and economic benefits to stakeholders. They are mainly centred on the procurement process by assessing the environmental, social and economic impacts of the goods and services sourced or purchased (Hughes and Laryea, 2013).

It is also observed from the literature that the implementation of SP practices is not an easy task due to the risks, contractions and complexity involve (Carter and Roger, 2008; Crespin-Mazet and Dontenwill, 2012), especially in the sector under study, which comprises of different firms with both international and national presence. However, considering the vital role of O&G sector in delivering sustainable development goals, firms within the sector must do more to integrate these practices within their organisational operations, with a precise focus on the procurement function. This way the benefits associated with SP practices, which include but are not limited to competitive advantage, risk reduction, improved reputation and financial savings, can be realised (Ahmad et al., 2016a; Paulraj, 2011).

The three facets of SP (i.e. environmental, social, and economic) as discussed in this chapter highlighted some of the expectations (practices) to achieve true sustainability. These practices, if well implemented, can result in competitive advantage and improve firm's

financial status while reducing its risks (Hoejmose and Adrien-Kirby, 2012; McMurray et al., 2014; Ortas et al., 2014). However, considering how broad SP practices are, it would help if the link between the three facets of SP practices (environmental, social or economic) are examined. For example, if the implementation of practices under a particular facet can lead to the realisation of the TBL. Thus, firms within the Nigerian O&G sector can focus on such SP practices that can result in multiplier effects on their sustainability performance. There are barely studies that investigated the underlying relationships of SP practices. Therefore, this research seeks to feel this gap, which is very crucial because the O&G sector is frequently associated with environmental challenges, yet the social implications of the O&G sector remain alarming.

Though the public assumes that the O&G sector cannot be sustainable considering the effects of its operation, the public must also not forget to think about the benefits of the O&G sector (Ekiugbo and Papanagnou, 2017). For example, the O&G sector plays a vital role in achieving sustainable development goals because of its products, which are widely used in economic and social activities (Ahmad et al., 2016a; George et al., 2016). For this reason, any efforts toward minimising the impact of the O&G sector are encouraged no matter how little. Emphasising this point, George et al. (2016, p. 197) noted thus: *"…in view of human dependence on non-renewable energy, which leads to the oil industry's continued existence, any effort to reduce the negative impact of such a destructive industry, however minimal, should not be undermined*".

For the O&G sector, SP practices such as the collective design of platforms that are less harmful to the environment, asking contractors and suppliers to commit to waste reduction, reduction of GHG emissions, the design of green products and processes, and the use of green energy solutions are applauded. Also, the purchase of materials, goods and equipment can be done in accordance with SP practices. For example, buying from minority or women-owned business enterprises, buying from local suppliers, buying items with less environmental and social impacts, buying high-quality goods and materials, and having a fair and transparent bidding process for all contractors and suppliers (Fossgard-Moser, 2003). Some materials and equipment used within the upstream O&G sector that could benefit

from SP practices may include *wellhead equipment, subsurface equipment, pumps, sucker rods and pull rods, electrical equipment, tubular materials, i.e. drill pipe and casing, drilling materials and machineries, construction machineries, vessels, rigs, and water trucks* (EKT Interactive Oil and Gas Training, 2016). O&G firms looking to buy, hire or operate these sorts of materials and equipment should consider only those with the smallest operational footprints with the least emissions and noise levels and utilise local employment. Appendix 1 contains some applicable SP practices that firms can adopt and implement within the O&G sector.

2.9.4 Sustainability measures within Nigerian O&G sector

Given the sparse nature of research work on SP practices within the Nigerian O&G sector, the researcher was unable to pinpoint the SP practices of selected firms. The researcher was, however, able to find information on the sustainability efforts of these firms within the sector, as presented in Table 2.8. As this practice is voluntary though, a lot of the information about their sustainability efforts is basic. This can easily be linked to the fact that in Nigeria it is not a legal obligation to report sustainability performance (Musa et al., 2013; Ndhlovu, 2011). See also Asaolu et al. (2011) where it is observed that sustainability reporting within the Nigeria O&G sector are inconsistent. This is also in line with the study of Hubbard (2011), where it is suggested that factors such as firms' strategy, industry context, external pressures as well as corporate size and profitability determine their reporting requirements. Notwithstanding, a general understanding from these reported measures suggest that firms adopt them on a priority basis.

Table 2.8: Some sustainability measures of Nigerian O&G firms

O&G Firms	Sustainability measures
Chevron	**Environmental:** In 2012 Chevron reduced its greenhouse gas emissions intensity by 0.7 metric tons of $C0_2$ per 1,000 barrels at the upstream operations and by 0.4 metric tons of $C0_2$ at the downstream. **Social:** Provisions of potable water supply, health care and educational facilities as well as scholarships programme.
Shell	**Environmental and technology:** Shell introduced 'Green stream batch', which utilises Liquefied Natural Gas (LNG) as fuel to transport diesel, oil, and unleaded petrol to the Netherlands, Belgium, Germany, and Switzerland. Shell also reduced

	gas flaring in Nigeria by 75% between 2002 and 2013 while also making enormous economic contributions to this region. **Social:** In 2003 Shell launched a youth entrepreneurship programme tagged 'LiveWIRE' in Nigeria to help trained individuals and provided business start-up funds to more than 3,000 trainees. Provisions of potable water supply, health care and educational facilities as well as scholarships programme.
Oando Plc	**Economic:** Employing locals (98.4%) and buying from local suppliers. **Social:** Invest in education, training and development programme for stakeholders and provide infrastructural development for communities. Promotes ethical practices, i.e. have an anti-corruption policy, treats its staffs, suppliers and other stakeholders fairly. Participates in UN's Global compact programme. **Environmental:** Reduce its environmental impact to society, by reducing its air pollution and waste. Subsequently, it adopted a policy to reduce, to reuse, recycle and recover. ISO 14001 accredited.
Eni	**Fatal work-related accidents:** With regards to fatal work-related accidents, which has been a major issue, Eni launched a program it tagged 'ENI in safety' for proper training and awareness of staff and contractors in order to achieve a zero fatality target **The oil spill and remediation:** Also due to the oil spill problems ENI faced in different operation locations, it has arranged to improve its emergency response performance and capabilities and put in place remedial action to recover hazardous waste. ENI is also engaged in global initiatives, such as, Coastal Oil Spill Improvement Program (COSPIP) and IPIECA West, Central, and Southern Africa (WACAF) that will help develop strategies for oil spill prevention
ExxonMobil	**Economic:** Encourage and supports local employment. **Social:** Provisions of potable water supply, health care and educational facilities as well as providing scholarships to Nigerians to study. ExxonMobil initiated a 'Nobody Gets Hurt' at work program, putting the safety of its employees and contractors as a top priority. ExxonMobil has engaged itself in the social aspect of sustainability by setting up a new committee for infectious disease to control diseases such as malaria, dengue fever and cholera in tropical climate countries, which could affect employees and communities. In terms of training, ExxonMobil's Procurement Sustainability Network was involved in the training of around 200 staff in the area of procurement sustainability in 2012. **Environment:** ExxonMobil published a framework for water management in 2014, which comprises four key commitments. This was to further strengthen its commitment to minimising water consumption, withdrawals and discharges, which had already recorded a decline of 15 per cent usage of freshwater between 2007 and 2014. To avoid oil spills the firm has implemented enhanced surveying techniques and technologies to help analyse and monitor pipelines.
Total Oil Company	**Environmental:** Total Ecosolutions was introduced in 2009 and by 2012 Total

	Ecosolutions products and services have avoided 740,000 metrics tonnes of $C0_2$ emissions (Total Ecosolutions is a flagship program to promote smarter, more frugal energy consumption, by cutting natural resource use and environmental impact while providing the same level of service). Total also ended gas flaring in its Ofon Field in Nigeria, which results in a 10 per cent reduction of gas flared in its exploration and production operations. **Social:** Buying from local suppliers and contractors. Assisting local contractors to develop capabilities and skills to international standards. Provisions of potable water supply, health care and educational facilities as well as scholarships programme. **Economic:** Employing local qualified graduates and technicians.
Conoil PLC	**Environmental:** Reducing its waste and water usage, reduce gas flaring activities. **Social:** Provisions of potable water supply, good roads, health care and educational facilities as well as scholarships programme. Partnering and supporting local charities. Implementation of local content in all functions. Employing local qualified individuals. Sourcing and buying from local contractors and suppliers.
British Petroleum (BP)	**Safety:** Following the recent oil spill in the Gulf of Mexico, the investigating team recommended 26 tasks which will help reduce risks and enhance operational safety in oil and gas activities out of which 15 had already been dealt with by the end of 2013. This is also in addition to BP's operating management system, which incorporates company requirements with regard to environmental, health and safety (EHS), social responsibility, operational reliability, contractor management and other relevant issues.
Saipem Nigeria Ltd	**Social:** Implement local content by working with local suppliers, developing infrastructure activities, organising development programmes in the form of industrial training as well as scholarship programmes. **Economic:** Promoting local employment, contributing economically to the Nigeria economy through social efforts. **Environmental:** Reducing environmental impacts like greenhouse gas emissions.
Halliburton	**Social:** Ensures suppliers meet minimum standards, engaging local suppliers, reduced injury at work by implementing active HSE approach, enhancing the economic and social well-being of employees and communities, donating to local charities and educational institutions and providing scholarships. **Economic:** Promoting local employment, local content implementation. **Environmental:** implemented improve ways of disposing of waste and recycling, reducing environmental impacts like greenhouse gas emissions and reducing their energy consumption. In compliance with major management system standards, i.e. ISO 9001, ISO 14001, OHSAS 18001, API Q1, API Q2 and API RP 75.

Sources: Alazzani and Wan-Hussin (2013), ExxonMobil (2015), Halliburton (2016), Oando PLC (2013), Saipem (2016), Schneider et al. (2013), Shell (2015), Total (2015).

There is evidence from Table 2.8 to suggest that aspect of SP practices being implemented across the Nigerian O&G sector are targeted at improving the environmental, safety, economic, social, community, and equality dimensions. The sustainability measures highlighted in Table 2.8 also support the notion that firms' sustainability efforts should encompass the TBL (Ahmad et al., 2016a). The above efforts are also parallel with the general sustainability strategies of O&G firms, which involves employee and community strategies, environmental strategies, and climate change strategies. It is worthwhile to mention that considerable attention is given to environmental, safety and community (social) improvement aspects of sustainability. It is true also that the involvement of suppliers and contractors in the design of environmentally friendly platforms or rigs is hardly mentioned in the reports, even though contractors and suppliers play important roles in both the construction and operation phases of O&G projects. This, therefore, raises doubt on how well the Nigerian O&G supply chain is been manage. Because despite the sustainability measures claim to have been adopted within the O&G sector, several environmental challenges have been observed. For instance, while BP has continued to invest in sustainability issues especially environmental aspects, it was involved in one of the world's most perilous oil spills in 2010. Secondly, although Shell is seen to have made significant improvements in its environmental and technological performances over the years (Schneider et al., 2013), the impact on its environmental performance remains daunting as oil spillages remain a habit of its activities (Kadafa 2012; Shell, 2015). Thirdly, ExxonMobil has continued to record high oil spillages even with its commitment in this area of operations (ExxonMobil, 2015).

Whereas challenges such as those mentioned above can be attributed to lack of commitment from staff in some cases where sustainability strategies are in place, but staff abdicate responsibility in adhering to these strategies, authors are of the view that information contained in sustainability reports are often 'greenwashing' (Hubbard, 2011). This notion cannot be erroneous in the Nigerian context, because sustainability performances reported by most of the O&G firms are global related performances with no clear link to their local affiliates (Asaolu et al., 2011). According to Asaolu et al. (2011), the major O&G firms in Nigeria do not report key sustainability performances, especially in

relation to environmental and social issues. For instance, spills and discharges, biodiversity, wastes and residual materials, as well as air emissions are not being reported. This is also evident in the 2017 corporate responsibility performance data published by Chevron Global.

However, the reporting of sustainability practices as noted above is faced with numerous challenges (Mansi, 2015). These challenges also limit the researcher access to published information on sustainability and SP practices in particular. This problem is not new to this research area as noted in Schneider et al. (2011), Musa et al. (2013) and Ahmad et al. (2016a), where different difficulties in accessing and obtaining data were highlighted. For instance, sustainability reports are difficult to find and expensive to purchase. Another important challenge is the non-standardised method of reporting sustainability (Schneider et al., 2011). For example, the method used by Shell in reporting sustainability, i.e. significance to Shell strategy, significance to stakeholders, significance in sustainability context, which it does in accordance with other guidelines such as the Global Report Initiative (GRI) version 3.1 (Shell, 2016), would be different from those used by other firms within the sector.

Furthermore, the researcher observes that throughout the literature review process relating to the Nigerian O&G sector, there was no specific mention of 'sustainable procurement or purchasing'. This is despite the unequivocal stance of several authors, who believe that the procurement function, due to its direct link to suppliers and contractors, has the ability of nurturing sustainability measures down the supply chain (Grant et al., 2015; Haake and Seuring, 2009; McMurray et al., 2014; Mena et al., 2014; Nikbakhsh, 2009; Walker and Brammer, 2009). The literature emphasised that firms targeting sustainability should, as an obligation, involve their suppliers and launch environmental and social standards to help gauge supplier performances (Humphreys et al., 2003; Schneider and Wallenburg, 2012). This is particularly relevant for the O&G sector, which is criticised for lagging in sustainability issues (Pulver, 2007; Schneider et al., 2011; Schneider et al., 2013).

As already noted in this chapter, several authors have proposed ways of incorporating sustainability measures into the procurement process, e.g. Roman (2017). With the availability of several methods for incorporating sustainability measures into the

procurement process, it is still widely argued that there is no clear guide on how the three facets of sustainability can be incorporated to improve firms' performances. Apart from the vague implementation process of SP practices, there are also issues regarding how the impact of SP practices can be measured because it lacks an effective performance measurement mechanism (Kalubanga, 2012). However, the link between SP practices and firm performances is of great importance to this study. This is mainly because the mixed perception on whether SP practices could lead to improving firm performances is impeding is implementation.

Although the above challenges had obvious implications on the adoption of SP practices, the adoption of broad sustainability practices is evident on a global scale (George et al., 2016; Infante et al., 2013). In the UK, precisely the O&G sector supply chain, there is evidence that sustainability and green practices impact both business activities and firms' performances (Yusuf et al., 2013). However, this cannot be claimed in the case of the Nigerian O&G sector considering the sparse nature of academic studies. As earlier mention, the extant literature stressed on the procurement function and the need for supplier involvement in sustainability projects (Amindoust et al., 2012; Azadnia et al., 2015; Buyukozkan and Cifci, 2011; Ersoy et al., 2012; Govindan et al., 2013; Meehan and Bryde, 2011). Yet, it is still uncertain how suppliers, contractors and other key stakeholders are involved in sustainability initiatives within the Nigerian O&G sector.

The above-highlighted issues are some of the challenges motivating this research, which seeks to obtain primary data rather than focus on already published data, although available data will provide the foundation on which this research is built. Thus, the researcher argues that it is both empirical and informative to undertake this study to evaluate SP practices from a developing country's perspective, like Nigeria. In addition to the above issues, no academic studies have specifically investigated SP practices within the Nigerian O&G sector. This statement is justified by the dearth of SP literature within the O&G sector in general. To the best of the researcher's knowledge, there is a paucity of academic studies of SP practices within the Nigerian O&G sector, a sector characterised by huge procurement activities. This absence could be due to the practical difficulties in conducting research within the O&G

sector (Ahmad et al., 2016b), or other factors, such as, lack of awareness, abundance of related terms, low expertise, lack of funds and lack of interest in this area of study, or even the fact that this area of study is new. This signifies the need to study the drivers and barriers of SP practices within the Nigerian O&G sector as presented in the research objectives section. Also, given the fact that the O&G sector is the main source of economic generation and infrastructural development in Nigeria, SP practices within this sector will unquestionably lead to the overall sustainability improvement of the country.

2.10 The conceptual framework of this study

It is evident from the existing literature as discussed above that SP practices is influenced by several drivers (McMurray et al., 2014; Sroufe, 2003; Walker and Jones, 2012; Walker et al., 2008; Yusuf et al., 2013). For example, government policies and regulations, institutional pressure, environmental management certifications and engaging in UNGC initiative. It is also evident that the implementation of SP practices lead to positive environmental, social and economic performances of adopting firms (Bag, 2012; Bansal, 2005; Bobis and Staniszewki, 2009; Bose and Pal, 2012; Esfahbodi et al., 2016; Pullman et al., 2009; Theron and Dowden, 2014; Zhu and Sarkis, 2004). It is in line with this perception, this present study seeks to examine the relationship between some key drivers of SP practices and its implementation within the procurement functions of Nigerian O&G firms. For example, the effect of ISO 14001 certification, UNGC initiative and clear SP strategy on SP implementation. The decision to specifically assess these three drivers is as a result of the lack of clarity within the existing literature regarding the influences of these drivers on sustainability implementation. In addition, drivers of SP practices have not been explored within the Nigerian O&G sector. Also the link between some key drivers of SP practices, for example, top management support, expertise and commitment and SP practices have previously been studied (Grandia et al., 2013).

Furthermore, this present study seeks to examine the impact of SP practices on firms' performances. However, this study will only examine the financial and non-financial impacts, rather than the broader TBL perspectives, which includes environmental and social features. This is because the existing literature is quite clear on the link between sustainability

practices and environmental performances (Esfahbodi et al., 2016; Islam et al., 2017a; Yook et al., 2018; Zhu and Sarkis, 2004), as well as the challenges of measuring social performances (Miemczyk et al., 2012; Morioka and Carvalho, 2016). It is also important to state that this study focuses on providing a business case for the adoption of SP practices, which is mostly associated with the financial performances of firms.

In line with the above discussions, which reestablishes the conceptual understanding of SP practices and its resulting outcomes, this research will examine the theoretical underpinning relevant to this research (Carter and Rogers, 2008). However, there is a lack of SP theories. This situation, coupled with the challenges encountered by firms in implementing sustainability measures, has led to the adoption of different theories, approaches, techniques and frameworks development alongside the supplier involvement paradigm to operationalise SP practices (Carter and Rogers, 2008; Mena et al., 2014; Roman, 2017; Walker and Brammer, 2009). For example, *resource-based view (RBV) theory*, *stakeholder theory*, *institutional theory* and *transaction cost theory* are some of the most common theories used in the extant SP literature (Carter and Easton, 2011; Grob and Benn, 2014; Touboulic and Walker, 2015; Vachon and Klassen, 2006). This highlights the need for theory building in sustainability research as repeatedly stated across the literature (Grob and Benn, 2014; Touboulic and Walker, 2015; Zsidisin and Siferd, 2001). According to Touboulic and Walker (2015), the development of theories would lead to the introduction of original ideas and theory testing in the sustainability domain.

In addition to theories, some common approaches and techniques used in operationalising SP practices were also observed in the literature. These include; *life cycle assessment (LCA)*, *carbon footprinting*, *whole life costing*, and *closed loop* (Hasselbalch et al., 2015; Hughes and Laryea, 2013; Nikbakhsh, 2009; Walker and Jones, 2012). Furthermore, the publication of *BS8903:2010 sustainable procurement* (BSI, 2010), *CIRIA C695* (Berry and McCarthy, 2011) and other guidelines, principles and standards, have all proposed ways in which SP as a practice can be operationalised by both private and public sector firms. For instance, the *'UNGC Principles'*, *'Procuring the Future: Sustainable Procurement National Action Plan'*

(Mansi, 2015) and the recent *ISO 20400* provides explicit guidelines on how to implement SP practices.

One key observation from the literature review conducted in this research is the emphasis placed on institutionalising frameworks and policies to foster sustainability implementation within the Nigerian O&G sector. Also, following a critical examination of the literature review including the main research debates and issues relating to SP practices in general and in specific to the Nigerian O&G sector, this study will rely on the *institutional theory*. The researcher argues that this is the most relevant and suitable theory to explore and gain an informed understanding of the various elements needed to implement SP practices within the context of the study. Although there are other theories as noted above, the *institutional theory* is one of the most prevalent and widely adopted theory significantly applicable in this research context (Carter and Easton, 2011; Grob and Benn, 2014; Hoejmose et al., 2014; Roman, 2017; Touboulic and Walker, 2015). It is also argued that the challenges of implementing innovative approaches in developing and emerging economies are far complex when compared to those of developed economies (Silvestre, 2015), hence the reliance on the institutional environment is crucial for the implementation of SP practices within the context of the study.

Although the availability of endogenous factors, i.e., internal resources and capabilities, as proposed by the RBV theory, facilitates the implementation of SP practices (Grob and Benn, 2014), exogenous factors, such as regulations, policies and institutional frameworks appears to be the main driver of sustainability practices within the context of study. This corroborates the existing literature, which emphasised the key role of institutional pressure in implementing sustainability initiatives regardless of the industry involve (Dawson and Probert, 2007; Hoejmose et al., 2014; McMurray et al., 2014; Walker and Brammer, 2009; Zhu and Sarkis, 2007). This study, therefore, attempts to also address the work of Grob and Benn (2014) which promotes the use of institutional theory in exploring the implementation of SP practices.

2.10.1 Institutional theory

The concept of institutional theory originated from the work of Meyer and Rowan back in 1977 and was developed further by DiMaggio and Powell (1983). DiMaggio and Powell (1983) noted that firms within specific sectors tend to follow similar business approach over time. This process of homogenisation according to them is called *isomorphism*. *Isomorphism* is described as a constraint that forces firms to copy the assumed best practices of other firms that faces the same environmental or regulatory pressures. In other words, the institutional environment in which firms operate has a major influence on their operations and practices. This theory suggests firms are more likely to adopt SP practices due to *isomorphic* constraints in the form of *coercive, mimetic* and *normative* pressures within their institutional environment (Grob and Benn, 2014; Roman, 2017).

Institutional theory has been used to examine the influences of institutional pressures on the adoption of sustainability practices (Grob and Benn, 2014; Roman 2017; Touboulic and Walker, 2015). Zhu et al. (2013) studied the antecedents and performance outcomes of GSCM practices and found that institutional pressures lead to the adoption of GSCM practices. In a similar study, Hoejmose et al. (2014) found a positive relationship between the adoption of cooperative and coercive GSCM practices and institutional pressures. In fact, the existing literature posits that institutional pressures are the strongest influence for adopting sustainability practices in the hunt for legitimacy. Be it *coercive, mimetic* or *normative* pressures, these three types of pressures, to some extent has helped in shaping the way firms operate.

2.10.1.1 Coercive pressure

Coercive pressure is referred to as pressure that emanates from both formal and informal forces, such as government regulations and policies, or industry-specific regulations that are been enforced (DiMaggio and Powell, 1983). The role played by coercive pressure in the form of government regulations, laws and policies and customers' demand in asserting pressure on firms to implement SP practices is documented across the existing literature. For instance, the study of Ruparathna and Hewage (2015) found that government regulation is the main factor driving firms to implement SP practices. This finding agrees with the extant

literature, which suggests that coercive government laws and regulations drive SP implementation (Bansal, 2005; Giunipero et al., 2012; Hoejmose et al., 2014; Walker et al., 2008; Zhu and Sarkis, 2006). In addition, coercive pressure in the form of contracts of engagement and supplier evaluation programs are also used by the major international oil companies on contractors and suppliers to adopt best practices.

Although, it is argued that the Nigerian O&G sector's legal and regulatory frameworks are weak (Idowu and Lambo, 2018; Kadafa, 2012 Odoeme, 2013; Orji, 2013; Vaaland et al., 2012), the improvements observed in the sector thus far, is as a result of these weak policies and regulations, thereby validating the importance of coercive pressures, such as government policies and regulations. Evidently, from the literature review, these weak policies and regulations have helped in coercing the sector's players into incorporating CSR and other sustainability initiatives across their businesses (Alabi and Ntukekpo, 2012; Musa et al., 2013). The literature review concerning the Nigerian O&G sector also reveals the incessant demand for strict regulations and laws that can help stimulate SP practices across the sector. It is, therefore, argued that coercive pressure can help firms take up initiatives to mitigate barriers deterring their sustainability efforts. For instance, due to coercive pressure a focal firm, may develop new skills and capabilities, train employees and involve their suppliers in developing sustainable products.

2.10.1.2 Mimetic pressure

Mimetic pressure is the act whereby some firms imitate other firms whom they consider successful or as leaders in their industry by adopting similar practices as those adopted by the assumed successful firms in the same institutional environment (DiMaggio and Powell, 1983). This is mostly applicable in an uncertain environment, like the O&G sector which is characterised by several complexities ranging from political to supply chain issues (Ahmad et al., 2016a; Caniëls et al., 2012; Olsen et al., 2005; Saad et al., 2014). With the small numbers of players within the upstream Nigerian O&G sector and its complexity thereof, firms are more likely to rely on their institutional environment, by mimicking each other, as well as seeking advice from experts within the field (Roman, 2017). Considering that sustainable products are still underdeveloped across the O&G sector, some firms are likely going to face

implementation challenges when addressing sustainability issues within their operations. As a result, firms are expected to mimic the practices of early adopters of sustainability strategies whom they assume successful within the O&G sector.

The Nigerian O&G sector been a sector pioneered by corporations of international visibility with an awareness of sustainability practices has benefited from mimetic pressure set by these international O&G firms on indigenous oil companies, suppliers and contractors in a bid to gain legitimacy within the sector. For example, within the Nigerian O&G sector, firms mimic each other by obtaining ISO certifications and other relevant certifications to gain legitimacy on their commitment to quality and environmental assurance. This perception is in line with the study of Grob and Benn (2014) who argued that mimetic pressure also emanates from firms' involvement in established environmental management systems, voluntary frameworks, alliances and programs set up to encourage the implementation of sustainability practices. In addition, mimetic pressure can also come from competition. For instance, in a bid to be regarded as a legitimate competitor, a firm is pressured to implement SP practices because its competitors within the sector have implemented SP practices. The mimetic approach is argued to be cost-effective because firms mimicking others do not need high investment for experimenting on best practices since they are simply adopting the sustainability practices of successful firms within the sector.

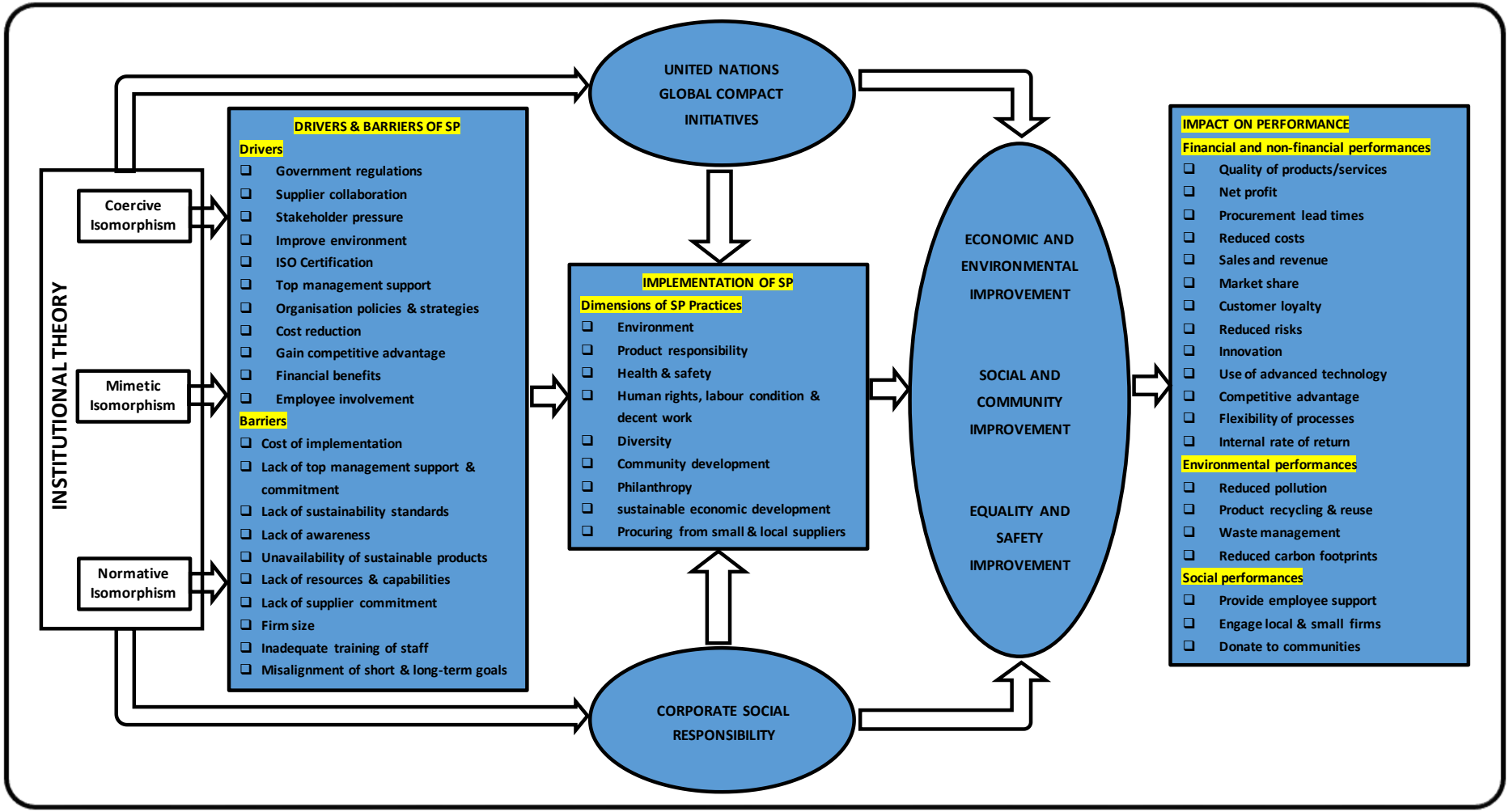

Figure 2.4: SP conceptual framework
Source: Author

2.10.1.3 Normative pressure

Pressure emanating from a firm's willingness to act professionally and legitimately refer to as normative pressure (DiMaggio and Powell, 1983; Grob and Benn, 2014). Institutional theorists believe that through association and networking, firms can grow their interest and knowledge on issues of sustainability. Participation in professional network and association can encouragement managers to uphold the values and standards of such association. Non-governmental organisations, such as the UNGC initiative, encourage members to implement its 10 principles proposed in line with the sustainable development goals (SDGs). It is argued that signing up to UNGC programs can accelerate firms' awareness and knowledge of sustainability challenges which can hitherto lead to the adoption of innovative approaches to mitigate these challenges (Ayemoba, 2016; Kell, 2013; McKinsey & Company, 2004; Rasche and Waddock, 2014; Rieth et al., 2007). Furthermore, the influence of environmental management systems, such as ISO 14001 is also very important in implementing broader SP practices (Simpson and Sroufe, 2014; Yusuf et al., 2013). Normative pressure from environmental networks can lead to the mitigation of environmental challenges, and as such, firms are more likely to gain awareness of the social and economic impacts of their operations and take necessary steps to mitigate them.

The difference with normative pressure is that institutions exerting these sought of pressures cannot enforce compliance with practices being promoted nor can they penalise firms for not complying. However, with coercive pressure, noncompliance is addressed by the governing institutions and appropriate penalties applied to offending firms. Non-governmental institutions, such as the UNGC initiative, ISO, Ethical Trading Initiative (ETI), fall into this category of institutions pressuring firms to adopt best practice approach, like SP practice, to mitigate sustainability challenges. However, some institutions demand full compliance otherwise membership can be revoked. See, for instance, the UNGC initiative (Eijk et al., 2018; Rasche et al., 2017). According to Lau et al. (2017), normative pressure in the form of stakeholder networking and engagement is very vital for the implementation of sustainability strategies. These authors argued efforts that bring stakeholders together to

deliberate on common issues – for example, sustainability – could lead to more implementation of sustainability practices.

In view of the above, is it clear that the relevance of institutional theory for implementing SP practices cannot be overemphasised bearing in mind the different institutional pressures firms are faced with and the need to involve different stakeholders in the pursuit of corporate sustainability. It is, therefore, argued that the implementation of SP practices is due to the coercive, mimetic and normative pressures firms are confronted with. These same pressures force firms to take up innovative approaches to SP practices that would not only lead to economic, environmental, social, community, equality and safety improvements but also lead to firms' performances as demonstrated in the conceptual framework (Figure 2.4). For example, institutional pressure forces firms to train employees, commit to SP agendas, develop a clear SP strategy, join UNGC initiatives and/or implement CSR policies, which could lead to the implementation of the dimensions of SP practices. The suitability and adoption of institutional theory in SP studies have been confirmed in the existing literature (Grob and Benn, 2014; Roman 2017; Touboulic and Walker, 2015). However, there are arguments in the literature which posits that institutional pressure could limit firms from advancing or developing their capabilities in response to sustainability challenges (Zhu et al., 2013). To overcome such limitations, firms should endeavour to take appropriate steps when formulating and implementing their sustainability strategies, this way improvements can be guaranteed. It is, therefore, contended that this theory is the most suitable theory to study SP practices, considering the above discussions and research context, which highly depends on its institutional environments as emphasised in the literature review.

2.11 Hypotheses development

To address ***OBJ3, OBJ4*** and ***OBJ5*** of this research, hypotheses are developed in line with the existing literature, particularly with reference to some of the research constructs highlighted in the conceptual framework to determine their influence on SP implementation within the Nigerian O&G sector. The discoursed in the extant literature and as shown in the conceptual framework, indicates there are different factors influencing firms into adopting SP practices, for instance, institutional environments, stakeholders or supply chain partners. Evidence

from the literature also suggests that a growing number of firms are adopting innovative approaches to show their commitment to sustainability challenges since they are accountable for the impact of their operations on the environment and society. These challenges are encapsulated under the TBL dimensions of sustainability, such as environmental, social and economic. However, from a more detailed and practical perspective, challenges of the TBL entails more. For example, environmental, social, economic, community, safety and equality issues are all vital elements of sustainability. It is these aspects of sustainability that the nine dimensions of SP practices seek to improve within the Nigerian O&G sector.

As noted in the previous section (2.10), this research seeks to examine the relationship between ISO 14001 certification, UNGC initiative, clear SP strategy and SP implementation. The relevance of these three important drivers has been explored previously, however further discussion to highlight the potential relationship between these variables and the implementation of SP practices as theorised in the existing literature will be provided. However, for clarity of the discussions, the hypotheses developed herein are grouped into three different categories, environmental and economic, social and community and safety and equality. This is because, from the literature review conducted in this research, the sustainability measures of the Nigerian O&G sector are mainly directed in this direction. In addition, to address ***OBJ5,*** the variables considered in this objective (firm size, turnover and time of apply SP) would also be examined to determine their influence on the adoption of SP practices.

The extant literature signpost that firms' characteristics have a major influence on their operations and ability to undertake certain activities, including the adoption of SP practices. For instance, observations from majority of the literature indicates that firms' size plays an important role in the implementation of sustainability practices, suggesting that larger firms are more likely to engage in sustainability practices than smaller firms (Lee, 2008; Vachon and Klassen, 2008; Yook et al., 2018; Zhu and Sarkis, 2004). However, the study of Walker and Brammer (2012) found no evidence to suggest that larger firms engaged in SP practices than smaller firms. Although the emphasis of this research is on the three main research

constructs (ISO 14001 certification, UNGC initiative, clear SP strategy) noted earlier, it is also the objective of this research to provide insights into the influence firms' characteristics have on the implementation of SP practices. This is imperative considering the limited and mixed perceptions shared within the literature (Guinipero et al., 2012; Lee, 2008; Lund-Thomsen and Costa, 2011; Sethi and Schepers, 2014; Walker and Jones, 2012). The approaches used for the regression model is consistent with business management and sustainably literature.

In line with institutional theory, ISO 14001 certification and participation in UNGC initiative are key essential sustainability initiatives O&G firms tend to implement (Simpson and Sroufe, 2014; Heras-Saizarbitoria et al., 2011; Rivera et al., 2006). It is considerably argued that these initiatives not only help firms to establish a strong CSR image but also to implement an SP strategy (Prajogo et al., 2012). ISO 14001 certification is considered as an important tool and driver of SP practices, which focuses on the improvement of firms' performance across the three facets of the TBL and meeting stakeholders' expectations (Simpson and Sroufe, 2014; Yusuf et al., 2013). SINOPEC, an energy giant, has keyed into these valuable initiatives by aligning its operations with the UNGC initiative and ISO 14001 standards (SINOPEC Wins, 2012). Furthermore, in developing countries where regulatory, legal and institutional systems are considered weak, internationally recognised frameworks, such as the ISO standards, UNGC initiatives, and ethical trading initiative (ETI) are regarded as invaluable assets in promoting sustainable behaviour. According to Vormedal (2005), governance is more about normative influences created in informal settings through debates and discussions. Lau et al. (2017), also opined that the use of formal rules as a mechanism to force firms to implement sustainable practices ineffective. They noted further that the UNGC initiative, which brings together different stakeholders to debate and deliberate on sustainability challenges appear more promising. The above argument theorises these two initiatives that are enabled by institutional forces, as drivers of SP adoption (Lund-Thomsen and Costa, 2011; Walker and Jones, 2012).

In addition, the need to have a clear SP strategy has been emphasised within the extant literature (Galpin and Whittington, 2012; McMurray, et al., 2014; Meehan and Bryde, 2011). According to the SP literature, having a clear SP strategy provides the platform from which

firms can operationalise SP practices (Walker and Brammer, 2009). From the institutional theory relied upon in this research, arrangements by firms to develop and adopt an SP strategy are driven by either coercive, mimetic or normative pressures. Having said this, empirical research suggests that there is a significant relationship between organisational strategy and sustainability performance (Galbreath, 2010; Hoejmose et al., 2013). It can, therefore, be argued, that normative pressure to achieve sustainability excellence drive firms to develop a clear SP strategy. In addition, having a clear SP strategy on how SP practices should be implemented within a firm is likely to secure the commitment of employees at all levels, which is vital for implementing SP practices. With commitment from different levels of the organisation, the resources required to implement SP practices would likely be available. Furthermore, employees are more responsive to officially documented strategy or policy frameworks as against informal instructions (Meehan and Bryde, 2011).

This notwithstanding, the relationship between ISO 14001, UNGC initiative, clear SP strategy and SP practices adoption has remained a subject of debate mainly due to the paucity of studies that explicitly examined this. To the best of the researcher's knowledge, no study has explicitly examined the relationship between these initiatives and SP practices. Understanding the influences these initiatives have on firms in implementing SP practices is vital, especially since these sustainability initiatives (ISO 14001 and UNGC initiative) are common and relied upon within the O&G sector, which is dominated by large firms (Jiang and Bansal, 2003). Therefore, this research is taking a proactive first step in this direction. The sections that follow provide discussions on the relationship between these variables and the three categories of SP practices (environmental and economic, social and community, and safety and equality) reflecting the focus of the Nigerian O&G sector as proposed earlier.

2.11.1 Sustainability initiatives, strategies and social & community improvement

Sustainability initiatives, such as the UNGC initiative and ISO 14001 certification focuses on mitigating environmental, social, human rights, labour rights and corruption challenges. For instance, the UNGC initiative encourages and improves the transparency and accountability of participating firms (Cetindamar and Husoy, 2007). Although the impact of UNGC on participating firms has been subjected to criticism (Sethi and Schepers, 2014), the

involvement of private sector firms in UNGC initiative in realising the goals of the United Nations with reference to sustainable development cannot be overemphasised considering the broad scope of UNGC programme (Runhaar and Lafferty, 2009; UNDG, 2016). The challenges of SP are global, whereas the strategies for achieving it at the community level are local, and can, therefore, differ in context and content from country to country (Jiang and Bansal, 2003; Walker and Jones, 2012), making its operationalisation very complex. This notwithstanding, the influence of UNGC initiative on the adoption of sustainability practices are promising (Lau et al., 2017). As highlighted in the literature, social and community issues within the supply chain of the O&G sector are addressed via CSR practices (Musa et al., 2013) to improve societal well-being, especially within areas of operation.

Secondly, whilst research that specifically examined the relationship between firms' involvement in environmental management systems, such as ISO 14001, and social and community performances is rare, the literature is quite clear that ISO 14001 has been instrumental in the adoption of SP practices as highlighted in the drivers of SP practices. The researcher, therefore, argues that involvement in environmental issues leads to more awareness and subsequent implementation of social and community improvement practices. This assumption is in line with the extant literature, which opined that ISO 14001 is a precursor for adopting SP practices. The work of Mustapha et al. (2014) also suggested that the implementation of ISO 14001 can help fast track sustainability practices across Africa.

Galbreath (2010) has explored the link between strategic planning and the social aspect of the TBL previously, to highlight the importance of having a formal strategic plan. According to the author, having a clear strategy provides a direction for everyone within the organisation to implement sustainability practices. In Walker and Jones (2012), enablers and barriers to implementing sustainability are discussed extensively. Specifically, their research identified amongst others the need for strategic alignment as a key enabler of sustainability practices. Their findings corroborated similar researchers in this regard (see Galpin and Whittington, 2012; White, 2009). In Brammer and Walker (2011), the need for having an official planning and strategic process is explicit to facilitate SP implementation to promote

socially responsible behaviour. Although there are studies where public or governmental bodies applied SP strategies to advance socially sustainable operations (Walker et al., 2012; Preuss, 2009), it is still not clear whether those strategies are linked with social and community practices in the private sector. However, insights gained from the study of Galbreath (2010), indicates there is a significant relationship between formal strategic planning and CSR practices like community and social improvements.

In line with this discussions and reasoning, the researcher reasonably argues that coercive, mimetic or normative pressures emanating from ISO 14001 certification and the UNGC imitative can influence firms to take up actions to improve their social and community performances (Mustapha et al., 2014). Similarly, institutional pressure from sustainability initiatives can result in a strategic direction which could subsequently influence the adoption of social and community-driven SP practices. Based on the above, the first set of hypotheses is suggested as:

H1a: *Those firms with a clear SP strategy have implemented measures of social and community improvement*

H1b: *Those firms that take up sustainability initiatives have implemented measures of social and community improvement*

2.11.2 Sustainability initiatives, strategies, and economic & environmental improvement

Although it is difficult for stakeholders to recognise the benefits of ISO 14001 certification and participation in UNGC initiative, their benefits and influence on improving firms' environmental performance and competitive advantage are documented within the literature (see Bansal 1999; Giménez Leal et al., 2003). Both sustainability initiatives have contributed to the continuous improvement of firms' activities in meeting and exceeding compliance with industry regulations. This situation has led to reduced environmental risk and improvement of participating firms' reputation (Potoski and Prakash, 2005; Sambasivan and Fei, 2008). Having said this, a critical analysis of the existing literature indicates that the adoption of sustainability initiatives, such as ISO 14001 and UNGC initiative does not entirely

lead to environmental or economic improvements. For example, some studies provide strong evidence to suggest that ISO 14001 leads to improved environmental performances (Arimura et al. 2016; Johnstone et al. 2007; Potoski and Prakash, 2005), whilst others showed otherwise (Delmas and Montes-Sancho, 2010; Zobel, 2016). The main argument is that the adoption of ISO 14001 and UNGC initiative do not necessarily lead to superior environmental and economic performances. Another argument is that these sustainability initiatives do not offer important task visibility but environmental opaqueness (Jiang and Bansal, 2003).

Also, it is argued that the mixed research findings in the literature are due to the different institutional pressures faced by sampled firms. According to Arimura et al. (2016), institutional settings play a vital role in firms' commitment to environmental impacts. They argued that firms faced with more stringent coercive environmental regulations are more likely to take up concrete actions to reduce their environmental impacts due to fear of legal sanctions or fines from regulatory agencies (Boiral and Henri, 2012). Their research, which found that Japanese firms take up actions, such as ISO 14001 certification to reduce the use of natural resources in comparison to their USA counterpart due to strict environmental policies on natural resource usage in Japan, further strengthen this line of discussion. In addition, the study of Boiral and Henri (2012) suggested that ISO 14001 certification is used as a means of gaining legitimacy rather than improving environmental performances. This perception is also held about the adoption of UNGC initiative, as researchers often feel it is just a way of gaining reputational advantages, rather than improving sustainability performances (Lau et al., 2017). However, in line with the motives of ISO 14001, the study of Sebhatu and Enquist (2007) suggested that ISO 14001 can be used as a means of promoting sustainability practices that can lead to sustainable development. Similarly, the study of Vormedal (2005) also suggested that the UNGC initiative can help firms implement innovative sustainability practices like SP.

Regarding the influence of clear strategy on environmental and economic improvement, Tan et al. (2011) argued that having a clear sustainability strategy and implementing the same can lead to competitive advantage. Firms are, therefore, not only expected to have a clear

SP strategy but that which is aligned with the overall organisational strategy. A commitment that is expected to yield several cascading benefits within firms (Galpin et al., 2015), and facilitates sustainability implementation and preservation. The need for having a clear strategic direction remains a crucial feature of achieving both economic and environmental improvement (McMurray, et al., 2014; Meehan and Bryde, 2011). On this note, special interest is taken in this study to ascertain its influence in the adoption of SP practices. It is, therefore, argued that institutional pressures emanating from ISO 14001 certification and the UNGC imitative can influence firms to take up actions to improve their economic and environmental performances. Similarly, institutional pressure can result in the development of a clear strategic path that could influence the adoption of economic and environmental-driven SP practices. Hence, the researcher posits as follows:

H2a: *Those firms with a clear SP strategy have implemented measures of economic and environmental improvement*

H2b: *Those firms that take sustainability initiatives have implemented measures of economic and environmental improvement*

2.11.3 Sustainability initiatives, strategies, and equality & safety improvement

Firms engaged in SP initiatives, such as UNGC initiative and ISO 14001, have more opportunities of networking and learning while also publicising their efforts for fair working conditions, improving pay, working hours, safety and equality, and environmental improvements (Cetindamar and Husoy, 2007; Vormedal, 2005). Validating the significance of SP initiatives, Rasche and Waddock (2014) argued that they are an important mechanism for improving organisational sustainability performance and global governance. Without sounding too pedantic, firms' involvement in UNGC initiative can lead to their commitment to safety improvement and subsequent implementation of best-known sustainability practices (Ayemoba, 2016; Kell, 2013; McKinsey & Company, 2004; Rieth et al., 2007). Similarly, organizations with ISO 14001 accreditation may also harvest moral legitimacy by embracing socially accepted techniques and ensuring that their suppliers achieve zero harm

in respect to health and safety (Delmas, 2001; Sambasivan and Fei, 2008). This can be achieved by encouraging and involving all employees to gain their commitment.

As well as environmental improvement, sustainability initiatives aim to increase diversity and equal opportunities within supply chains. Firms with clear SP strategies tend to endorse labour standards, provide employment opportunities for people with disabilities, and promote gender, racial and ethnic equality (Arimura et al., 2016; Giménez Leal et al., 2003; Heras-Saizarbitoria et al., 2011). SP practices help firms to ensure also that suppliers' locations are operated in a safe manner and that safety comes first when there is an incoming movement of products to firms' facilities (McCrudden, 2004; Schylander and Martinuzzi, 2007; Wahba, 2008). However, it is still not clear whether SP practices implemented by firms lead to a safe and secure workplace that is conducive to the health, safety and wellbeing of employees, and how those practices should be incorporated into firms' SP strategy by focusing on excellence rather than uniformity (Jiang and Bansal, 2003; Boiral and Henri, 2012; Simpson and Sroufe, 2014). The researcher contends that institutional pressure emanating from firms' involvement in UNGC initiative and ISO 14001 certification and development of a clear SP strategy, could influence their commitment to adopt equality and safety-driven SP practices. The above discussion leads to the following hypotheses:

H3a: *Those firms with a clear SP strategy have implemented measures of equality & safety improvement*

H3b: *Those firms that take sustainability initiatives have implemented measures of equality & safety improvement*

The 6 (six) research hypotheses shown in Figure 2.5 are drawn from the existing literature and suggests that institutional pressures emanating from firms' involvement in sustainability initiatives can influence the adoption of SP practices that focus on social and community improvement, economic and environmental improvement as well as equality and safety improvement. These pressures could be as a result of coercive, mimetic or normative forces

driving firms to implement innovative approaches to mitigate sustainability challenges. The researcher argues that firms would normatively want to act lawfully by conforming with acceptable standards and practices within the O&G sector to protect their reputation. This assumption is as a result of the reliance on ISO 14001 and other certifications as evidence of legitimacy within the Nigerian O&G sector and therefore, reiterates the significance of institutional theory in this study, which also focused on the key drivers of SP practices.

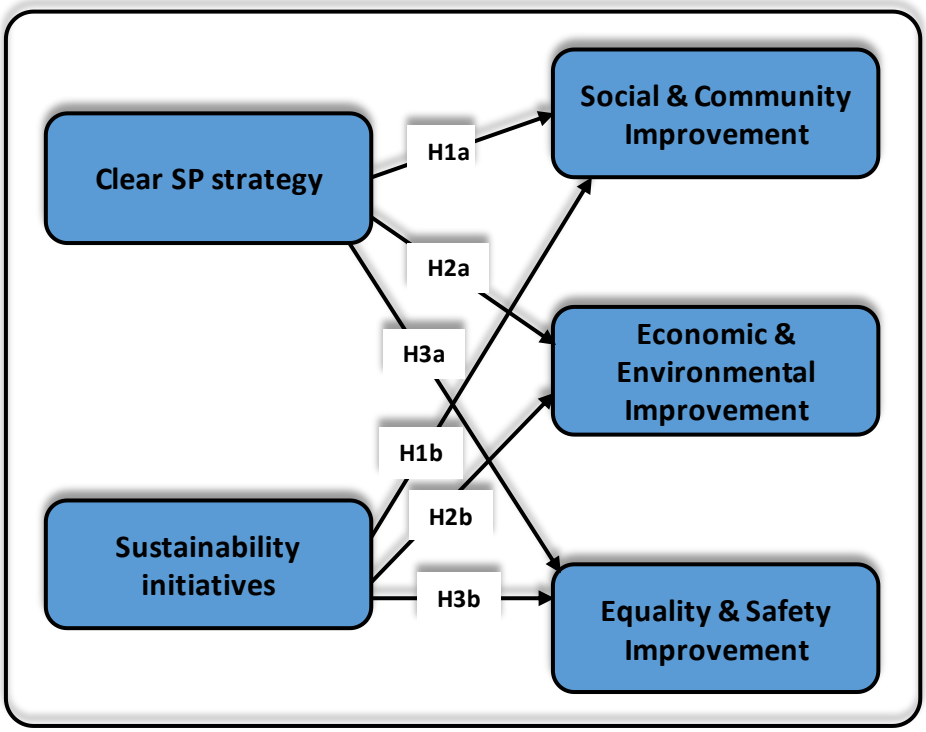

Figure 2.5: Hypotheses model of SP adoption
Source: Author

The UNGC initiative, on the other hand, offers 12 clear principles which firms can use to mitigate human rights, labour conditions, environmental and corruption challenges whilst also providing a platform for firms to discuss, learn, network and build business relationship with industry players. Involvement in this sustainability initiative increases the chances of mimetic and normative pressures on firms to commit to sustainability challenges (Grob and Benn, 2014; Fussler et al., 2017; Runhaar and Lafferty, 2009). Hence, it was hypothesised that the UNGC initiative and ISO 14001 certification are the most influential sustainability initiatives that can help transform firms' operations and activities to become more

sustainable within the Nigerian O&G sector (Lau et al., 2017; Vormedal, 2007). Accordingly, this validates the suitability of the institutional theoretical perspective of this research.

It is also hypothesised that institutional pressures emanating from mimetic, coercive and normative forces, drives firms to develop clear SP strategy that can help with the implementation of SP practices with a focus to improve social and community performance, economic and environmental performance, and equality and safety performance. It is also worthy to note that, the institutional theory has been adopted in several similar SP studies as a theoretical lens (Abdalla and Siti-Nabiha, 2015; George et al., 2016; Grob and Benn, 2014; Roman 2017).

2.12 Summary

The aim of this chapter is to provide a critical review of the literature regarding the research phenomenon in relation to the context of the study to gain valuable and useful information for reinforcing the aim and objectives of this research. In specific, this chapter attempts to identify and evaluate relevant research debates and dilemmas around SP practices from both the public and private sector perspective. This approach is critical for establishing an appropriate theoretical lens and building a coherent and consistent argument relevant to the context of this research. Acknowledging the importance of SC, which procurement originates from, this chapter highlighted the recent shift in the management of SC that has now included sustainability issues. The management of SC including sustainability challenges has led to the creation of different concepts, e.g. SSCM, GSCM, SP, green procurement, sustainable design, sustainable production, sustainable distribution and sustainable consumption. With reference to the research objectives, the concept of procurement and procurement trends within the O&G sector were discussed to gain an understanding of the dominant relationship styles within the O&G sector. In addition, sustainability as a concept was discussed in relation to the TBL. The role of the procurement function in realising sustainability objectives as well as helping firms achieve financial, social and environmental performance were also critically discussed.

Moving forward, this chapter critically evaluated the research phenomenon (SP practices) by first synthesising some of the definitions of SP within the literature and offered, based on the extant literature and the context of the study, a definition of SP. Thereafter a critical analysis of SP practices was provided. This included the impacts of SP practices on firms' performances, the benefits of SP practices, the drivers and barriers to SP practices. This chapter also attempts to examine SP practices, including highlighting some of the challenges faced within the O&G sector, whilst also exploring the different sustainability measures implemented across the O&G sector. Notably, the chapter signpost the need for institutional pressure on firms within the sector to implement sustainability measures to deal with the growing concerns of stakeholders across the sector. The chapter also suggests the use of voluntary sustainability initiatives to promote the implementation of SP practices.

To conclude this chapter, the institutional theory was relied upon to explore the implementation of SP practices within the Nigerian O&G sector. The relationship between SP practices and the institutional theory is discussed in detail, emphasising on the relevance of sustainability initiatives, such as the UNGC initiative and ISO 14001 certification for SP implementation, upon which the research hypotheses are formulated. It is worth noting at this point that to ensure coherence in presenting the key research debates and dilemmas and to build a logical argument, repetition of words, phrases, or sentences have become necessary in the entire work. This was done to make sure the work is understandable and flows logically to readers. However, the researcher made efforts to reduce these repetitions. The next chapter describes the methods used to investigate the research phenomenon in this study.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter of the thesis considers the different paradigms and approaches available during a methodical research process and the adopted approaches for this present research. In brief, the chapter focuses on the research paradigm, approaches, design strategies, data collection techniques and data analysis techniques for this study. In addition, justifications for the adopted approaches were provided in line with the extant SP literature.

3.2 Research methodology structure

Research is referred to as *"a systematic and methodical process of inquiry and investigation with a view to increasing knowledge"* (Collis and Hussey, 2014 p. 2). Expanding on this definition Collis and Hussey (2014) added that the purpose of undertaking a research study are in multiple folds. For example, research can lead to the generation of new knowledge, the discovery of solutions to problems, to review and analyse existing knowledge or to clarify new research phenomena. However, in simplifying this view, Cavana et al. (2001) noted that research can be undertaken to either generate knowledge or solve a specific problem, with the former referred to as pure or basic research and the latter called applied research.

This current research is classified as pure research because it has the intent of generating and adding to the body of knowledge in the field of sustainability and business management in general. Though the main aim of this research is to explore current SP practices within the Nigerian O&G sector, this research also has as objectives the intent of investigating the underlying relationship between SP practices and assessing the links between sustainability initiatives and the adoption of SP practices within the Nigerian O&G sector amongst others. For clarity, the aims and objectives of this research are reproduced hereunder.

Aims: *"To determine the underlying dimensions of SP practices and to empirically examine the relationships among SP practices, performances, procurement sustainability strategy and initiatives within the Nigerian O&G sector"*

Objectives:

(1) To identify the current state, drivers, and barriers of SP practices in the Nigerian O&G sector;

(2) To explore the underlying relationships among SP practices in the Nigerian O&G sector by grouping them into factors;

(3) To examine whether sustainability initiatives such as ISO 14001 and UN Global Compact program drives firms to adopt SP practices;

(4) To ascertain whether having clear SP strategy drives firms to adopt SP practices;

(5) To study whether firms' corporate characteristics (size, turnover and time of applying SP), have an influence on the adoption of SP practices;

(6) To establish whether SP practices in the Nigerian O&G sector impact on firms' performances.

To achieve these objectives, this research adopted a logical approach, which is in line with the layers of Saunders et al. (2016) research onion. But first, it attempts to understand the philosophical assumptions upon which philosophies are built. Using the methodological approaches provided by Saunders et al. (2016) is common in business management research as it provides clear and in-depth information on the different methodological considerations. For example, it provides both the philosophical and practical elements significant for making informed methodological choices.

3.3 Philosophical assumptions

Research is undertaken to understand phenomena, change phenomena or to do both. The aims of such research – expected results and findings – are major factors in deciding the research methodology. In addition, the philosophical position of research is perceived to be a crucial starting point in the research design (Collis and Hussey, 2014; Crossan, 2003). It is also noted in Easterby-Smith et al. (2002) that the research design can best be done by understanding the research philosophy. Philosophy as a phrase emanated from a Greek word – *'the friend of wisdom'* (Cavalier, 1990). Research philosophy can be described as a system of beliefs and assumption about the development of knowledge, which comprises of a different approach to investigating an inquiry to uncover specific issues or gain knowledge.

Research philosophy offers researchers the opportunity to identify different ways of reasoning, interpreting, collecting and analysing data in the research process (Levin, 1988; Saunders et al., 2012). The choice of approaches, methodologies, strategies and method of data collection can be justified and explained properly through the understanding of research philosophy. There are several research philosophies, e.g. positivism, critical realism, postmodernism, pragmatism and interpretivism, which are based on three philosophical assumptions, e.g. ontology, epistemology, and axiology (Saunders et al., 2016). The knowledge of these philosophical assumptions as argued, would not only improve the skills and expertise of a researcher but also have a positive impact on the research been undertaken (Easterby-Smith et al., 2012; Holden and Lynch, 2004). Therefore, the main philosophical assumptions, e.g. ontology and epistemology, are discussed below.

3.3.1 Ontology

The ontological assumption refers to the stance of a researcher on the nature of reality and existence (Easterby-Smith et al., 2012). The Ontologist is influenced by the way he or she views the world. This said position can be either objective and external to the researcher or subjective and socially constructed (Collis and Hussey, 2014). This is also simply referred to as objectivism and subjectivism (Saunders et al., 2007). The objectivism position is concerned with the natural science and suggests that social reality is independent of social actors, while the subjectivist position is concerned with arts and humanities, suggesting that social reality is dependent on social factors (Saunders et al., 2007). This means that with the objectivism stance, researchers do not have any influence over their research objects, but with the subjectivism, the actions or perceptions of the researcher can influence their research objects.

3.3.2 Epistemology

On the other hand, the epistemological assumption relates to the acquisition of knowledge and how such knowledge can be disseminated to others (Saunders et al., 2012). This assumption also includes the approaches in carrying out an investigation into the nature of both the physical and social worlds (Easterby-Smith et al., 2012). The epistemological assumption attempts to validate knowledge through acceptable means with a view of

embracing such knowledge as legitimate knowledge. The use of epistemology is more prevalent in the methodology literature due to the availability of different methods it offers (Saunders et al., 2016). It is, however, imperative for researchers to know the implications associated with the different epistemological assumptions together with their strengths and weaknesses (Saunders et al., 2012). For example, the fact that the researcher has the opportunity of adopting different epistemologies or even combining them, should not be considered perfect but whether such a method is suitable for the research purpose. As the assumption adopted in research dictates its approach, researchers must take extra care when making their philosophical assumptions. Considering this, the philosophy adopted in research, be it positivism or interpretivism, should be closely connected with the assumptions made.

3.4 Research philosophies

The significance of understanding research philosophy cannot be exaggerated as it provides researchers with the opportunity of identifying the approaches for reasoning and interpreting the research process. As earlier mentioned, there are different research philosophies available to researchers to choose from in line with their research problems. Considering the conceptual nature of SP research, which is still new, it is important to discuss the philosophies, i.e. positivism, critical realism, postmodernism, pragmatism and interpretivism, available in business and management research. However, this research focuses on the two main research philosophies, i.e. positivism and interpretivism (Collis and Hussey, 2014; Malhotra and Birks, 2007).

3.4.1 Critical Realism

From the philosophy literature, critical realism is a subdivision of the wider realism philosophy, which consisted of direct realism and critical realism (Bryman and Bell, 2011; Saunders et al., 2016). Realism, which has been a dominant philosophy in natural and social science research, asserts that reality is external and independent to the researcher and that a specific data collection and interpretation technique can be applied in both natural and social science types of research (Proctor, 1998). Direct realism, which is more of a positivist stance, portrays the view that what is observed in the world is true and correct. In contrast,

critical realism emphasised that reality is external and independent of the observer and that reality cannot be accessed by mere observation or knowledge of it (Saunders et al., 2016). The critical realists believe that whatever we deduced from the real world are not the actual things but an expression of such things. The emphasis of critical realism is the curiosity of researchers for wanting to find out more about a phenomenon and not just concluding on the face of information observed. Although this current research would like to know the underlying motives of firms for adopting SP practices, it is outside the focus of this study, which therefore makes the critical realism philosophy inappropriate for this research.

3.4.2 Interpretivism

Interpretivism as a philosophy emanated from the supposed shortfall associated with the positivism approach (Collis and Hussey, 2014; Crossan, 2003; Saunders et al., 2016). The interpretivist philosophy is the belief that reality and social actors are one, and as such, social actors greatly influence reality. Interpretivists argue that an object of research cannot be separate from the researcher because it is extremely subjective (Creswell, 2014). Interpretivism stressed that individuals are not the same as physical phenomena because they create meanings and therefore seek to understand this meaning (Saunders et al., 2016). Interpretivists believe that because individuals originate from diverse backgrounds they could have different opinions about a phenomenon (Weber, 2004). For instance, interpretivists believe that culture, cultural beliefs and the gender of an individual can have a potential influence on their perception, which in turn can have a tangible impact on a research object (Proctor, 1998). Instead of measuring social phenomena like positivism, interpretivism seeks to explore the complexity surrounding social phenomena (Collis and Hussey, 2014). Interpretivism seeks rich data to create a new and better interpretive understanding of a research object (Saunders et al., 2016). This, the interpretivists can achieve this through the process of communication and interaction with the research object (Easterby-Smith et al., 2002).

Interpretivism is the view that people see things differently and so have different perceptions of what they see or read different meanings to what they see. Unlike the positivism philosophy, where researchers take a neutral stance and separate themselves

from the research object, the interpretivism philosophy adopts a compassionate stance and is closely attached to the research object. Interpretivists adopt qualitative research methods using an inductive approach to making sense of collected data. With this philosophy, researchers employ strategies that can provide detailed information and data, i.e. case study, interview or observational methods, from multiple viewpoints and then attach meanings to the collected data (Robson, 2011). Because of the compassionate stance of the interpretivist, researchers can easily manipulate data (Easterby-Smith et al., 2002). Considering the scope of this research, which is limited to investigating and analysing the adoption of SP practices rather than trying to uncover the underlying intent of its adoption, the interpretivism philosophy is deemed inappropriate for this research. In addition, the inability to generalise within interpretivism (Bryman and Bell, 2011) further strengthens the researcher's position, whose intent is to generalise the research findings to the Nigerian O&G sector.

3.4.3 Postmodernism

Like the interpretivism philosophy, postmodernism was derived as a critique of positivism. Postmodernism criticised known and accepted approaches and stressed the significance of language and power relations in research processes (Donaldson, 2003). Postmodernists argue that there are no specific means of understanding or describing the world, but rather this is shaped by the collective decisions of individuals (Saunders et al., 2016). A decision believed to be influenced by the power relations of these individuals, whose collective choices shall remain dominant and in force for the time being, even though such choices are not the most appropriate. This power relation is what postmodernism is probing. The postmodernist intention is to uncover inadequacies in an established structured way of undertaking a project. In other words, the aims of postmodernism are (i) to challenge, thoroughly, known ways of acquiring knowledge (Kilduff and Mehra, 1997) and (ii) to make known the other ways of acquiring knowledge that was deliberately removed previously (Chia, 2003). However, due to the criticisms associated with the postmodernism philosophy, and its unclear impact on research, researchers are reluctant in its adoption (Kilduff and Mehra, 1997). In view of these criticisms, Donaldson (2003) stated point-blank that organisational studies should not adopt the postmodernism philosophical approach.

3.4.4 Pragmatism

Unlike the other philosophies, which either question our reasoning and understanding of the world or affirm our reasoning and understanding, pragmatism states that reasoning and understanding are only relevant if supported with action (Saunders et al., 2016). According to Shariatinia (2016), the philosophical thought is made easy and accessible to individuals through pragmatism philosophy, a philosophy introduced by Pierce in 1878. The pragmatist is a strong conviction that facts influence our actions. The researcher's understanding of this philosophy is that every action has a resulting consequence. Pragmatism is a very flexible philosophy with regards to theories, ideas, and concepts. It utilises the most appropriate approaches available in conducting research. This, therefore, makes pragmatism philosophy applicable in either qualitative, quantitative, mixed method or multiple methods research (Saunders et al., 2016). The research design in pragmatism research is determined by the research problem and how best the research purpose can be achieved. Since its stance on the action is the equal consequence, variations are consequently inevitable in pragmatism research.

3.4.5 Positivism (this research philosophical stance)

The origin of the word *'positivism'* is somehow elusive. However, positivism considers observable social reality, which result can be a generalisation of similar results already produced by physical and natural scientists (Saunders et al., 2007). The main idea of positivism from an ontological assumption point of view is that the social world exists outside of social actors (Easterby-Smith et al., 2012). In other words, a research object and a researcher are two distinct entities (Weber, 2004). The positivist is a strong belief that knowledge can only be justified base on facts and not assumptions. On this note, it focuses on scientific empirical approaches in research inquiry to produce pure unbiased data and facts that cannot be influenced (Saunders et al., 2012). As there is a general assumption that social phenomena can be measured, the quantitative research method is deemed more appropriate to measure data derived from research objects (Collis and Hussey, 2014).

Besides the general assumption that positivists develop and test hypotheses from existing theories, positivists also develop research propositions for validating the same. For instance, apart from developing hypotheses, a researcher can choose to answer research questions. The use of survey and experimental tools are applicable within positivism philosophy, as positivists tend to stay neutral, detaching themselves from the research objects, especially data collection process, so as not to influence their research findings (Crotty, 1998). Whereas many will see this as unrealistic, it provides a guide on acceptable ethics of the positivist stance. As argued in the methodology literature, the positivist philosophy is the most appropriate approach when undertaking an inquiry on human and social behaviour (Easterby-Smith et al., 2012). Considering the foregoing discussion, this research adopts a positivist philosophy, because it allows researchers to identify and assess factors influencing a research outcome (Creswell, 2009), and support the use of quantitative research method (Eriksson & Kovelainen, 2008), which is adopted in this research.

Since, this research seeks to gather a large amount of data from the Nigerian O&G sector to ascertain the practical adoption of SP practices, the relationship between these practices, and to investigate its impact on firm performances and overall corporate sustainability, the positivist philosophy is considered more suitable for this research. The adoption of the positivist stance is best suited in this research because the research seeks empirical data to observe measurable facts, i.e. SP practices within the O&G sector. The positivism stance is widely adopted within organisational science research, which seeks to discovered and acquire new knowledge on research phenomena (Holden and Lynch, 2004). With the intent of developing and testing hypothesis, upon confirming the existence of SP practices within the research context, the positivism stance remains the most appropriate philosophy for this research. This is one of the dominant philosophical approaches within SP, sustainability and management research in general (Brammer and Walker, 2011; McMurray et al., 2014; Musa et al., 2013; Walker and Brammer, 2009; Yusuf et al., 2013). Besides, positivism philosophy has the potential to reduce researcher bias.

3.5 Research approach

The need for having a clear understanding of the purpose of research has been discussed at the beginning of this chapter. This research approach section builds on this discussion by assessing in detail the primary theoretical aim of this research, which according to Kovács and Spens (2005) is vital in any research study. There are three approaches to theory development according to the methodology literature (Kovács and Spens, 2005; Saunders et al. (2016). These approaches, i.e. deductive, inductive and abductive, are discussed hereunder.

3.5.1 Inductive approach

An inductive research approach is one where theory is developed from observations and findings of the research (Saunders et al., 2016). In other words, data collected in a research project are used to develop a theory. An inductive researcher is critical of the philosophical assumption, which insists that knowledge is not natural but a construct of our being. Subsequently, this approach is generally associated with the interpretivism philosophy and relies on grounded theory as a form of its data collection technique to develop a theory (Dubois and Gadde, 2002). The data collected in the inductive approach are mostly qualitative in nature (Bryman and Bell, 2007; Kovács and Spens, 2005). As well as the grounded theory, inductive researchers also use other strategies, i.e. case study, ethnography, action research and narrative inquiry. These strategies can be combined with specific research with the aim of collecting rich and in-depth data from a small sample for generating theory. However, in Bryman and Bell (2007) it is assumed that most studies that adopt an inductive approach do not always develop theory but rather provide an accurate and detailed understanding of research concepts. This assumption, therefore, indicates that not all inductive research develop theory, leaving the idea of theory generation in the inductive approach insignificant.

This research is not inductive because it has no intention of developing theories, which is the main characteristics of an inductive approach (Dubois and Gadde, 2002; Kovács and Spens, 2005; Saunders et al., 2016). Although the research problem is new in nature, which could warrant an inductive approach to develop theories, the researcher argues that the

dimensions of SP practices are well-defined and generally accepted in line with sustainability goals. In addition, there are existing theories, frameworks, guidelines and models of SP practices, which need testing or confirmation within the industry under study and the Nigerian context.

3.5.2 Deductive approach (this research approach)

In contrast to the inductive approach, the deductive approach is used to test an existing theory. The deductive approach utilises propositions developed from the observation of existing theory, which is thereafter tested in the real world (Dubois and Gadde, 2002). The expected outcome of deductive research may either verify or falsify the existing theory (Kovács and Spens, 2005; Saunders et al., 2016). As this research started by identifying and evaluating relevant theories, guidelines, models, frameworks and sought to collect empirical data to validate these existing theories, guidelines, models, frameworks, the deductive approach is said to be in force (Creswell, 2014; Saunders et al., 2012). Therefore, this research adopts a deductive approach. This is mainly because the dimensions of SP required for the operationalisation of this innovative practice, i.e. *(1) environmental; (2) product responsibility; (3) health and safety; (4) human rights, labour conditions and decent work; (5) diversity; (6) procuring from small and local suppliers; (7) community development; (8) sustainable economic development; (9) philanthropy,* as highlighted in the extant literature are the tested, valid and reliable dimensions of SP practices (Brammer and Walker, 2011; Mansi, 2015; McMurray et al., 2014; Walker and Brammer, 2009; Walker et al., 2012). Considering the role of the literature review in strengthening the conceptual and theoretical framework of this research, and the objectives of this research the use of the deductive approach is appropriate.

Since this research also intends to examine the effect of SP practices on firms' overall performances, the deductive approach is the best approach for explaining the relationship between the adoption of SP practices and subsequent firms' performances (Saunders et al., 2009). The deductive approach employs experiment or analytical survey strategies. In this research, an analytical survey is utilised to capture the dimensions, as well as practices of SP and the causal relationship between these practices are explored and discussed in the

research findings. These dimensions inform the analytical survey strategy used to investigate SP practices within the Nigerian O&G sector, which currently suffers from insufficient SP research. The adoption of a deductive approach is appropriate to test and confirm existing theories, frameworks, guidelines and models of SP practices within the Nigerian O&G sector. The deductive approach aligns with the positivism philosophical stance of this research, which is intended to generate new knowledge in this field.

Although existing theories, frameworks, guidelines and models of SP practices as noted in the literature were developed and proposed in developed countries, the researcher argues that they have been used in other contexts (Islam et al., 2017b; Lund-Thomsen and Costa, 2011; McMurray et al., 2014; Oyewobi et al., 2017) and can also be applied in the O&G sector because there are numerous proofs to indicate that good practices are transferred regardless of location, region or industry barriers. This is more so, in a developing country like Nigeria, which depends on good practices exhibited in developed countries. It is, therefore, imperative to investigate the adoption of SP practices to ascertain its adoption level, rather than developing a theory at this stage for an industry, whose adoption level and patterns are yet to be ascertained. The deductive approach is the dominant research approach used in logistics and supply chain management studies (Kovács and Spens, 2005; Oyewobi et al., 2017).

In addition to the standard questionnaire on SP practices used in this research, participants are also asked open-ended questions related to matters such as (i) the major drivers of SP practices in the context under study, (ii) major barriers of SP practices in the context under study and (iii) their view on SP practices in the context under study. Questions on drivers and barriers are included to find out if industry, region or location makes any difference and whether new items will emerge. It is important to note that this deductive approach can also utilise qualitative data as seen above (Saunders et al., 2016). This practice is common within applications of the deductive approach and social science research, which supports the use of open-ended questions (Steren, 2010). The major differences between the deductive and inductive approaches as highlighted by Saunders et al. (2009, p. 127) are reproduced in Table 3.1.

Table 3.1: Major differences between deductive and inductive approaches

Deductive emphasises	Inductive emphasises
• scientific principles • moving from theory to data • the need to explain causal relationships between variables • the collection of quantitative data • the application of controls to ensure the validity of data • the operationalisation of concepts to ensure clarity of definition • a highly structured approach • researcher independence of what is being researched • the necessity to select samples of sufficient size to generalise conclusions	• gaining an understanding of the meaning humans attach to events • a close understanding of the research context • the collection of qualitative data • a more flexible structure to permit changes of research emphasis as the research progresses • a realisation that the researcher is part of the research process • less concern with the need to generalise

Source: Saunders et al. (2009, p. 127)

3.5.3 Abductive approach

A general view of the abductive approach is that it is the combination of both deductive and inductive approaches. However, distinctive nature of the abductive approach is the role of conceptual framework developed from existing theories, which is, in most cases modified due to unexpected discovery observed in the research findings (Kovács and Spens, 2005). This is because the abductive approach starts from the observation of theories, and with a view to further investigate these theories, data are collected to form a conceptual framework, which is then tested with fresh data collected that could lead to theory development or theory modification (Saunders et al., 2016). The latter, theory modification, is more often associated with the abductive approach (Dubois and Gadde, 2002). Unlike the deductive approach where established variables are tested or confirmed, the abductive approach is focused on discovering new variables and relationships within research phenomena with the aims of modifying existing theories.

The points explained above, therefore, indicate that deductive and inductive approaches can be utilised simultaneously in a research study. This is an approach noted to have huge advantages over a single approach (Saunders et al., 2016). Kovács and Spens (2005) also stressed the advantages of abductive approach for theory development. While this perception may be right, it is not generally accepted within the literature on research approach (Dubois and Gadde, 2014). In supporting this position, Hurmerinta-Peltomäki and Nummela (2006) stated that the abductive approach is not necessarily the best choice of approach. They noted further that the right approach is that which will best solve the research problem and best fits the adopted research methodology. This position is highly collaborated by Saunders et al. (2016) who noted that the choice of a research approach should be determined by the research emphasis. The emphasis of the current study is to investigate SP practices and their resulting effects on corporate sustainability and firm performance. Considering that the practice in question is strictly organisational, the deductive approach already adopted is best suited for this research. Considering also that this approach involves more financial and time requirements (Hurmerinta-Peltomäki and Nummela, 2006), which are limited in this research, the researcher rejects it, especially since the chosen approach can be used to achieve the research aims and objectives.

3.6 Research method

One obvious reason for undertaking research is to uncover and tell the true state of an observation (Field, 2013). In Clough and Nutbrown (2007), the methodology is understood to mean techniques that show how research questions are expressed with questions asked in the field. This involves the methodological approaches adopted in the research process (Collis and Hussey, 2014). In this research, the researcher is keen on investigating the adoption of SP practice within the Nigerian O&G sector. This is because the researcher is not convinced that this practice has been openly adopted across the sector, which led to the development of the research questions. Considering the research aims, which is to ***"to determine the underlying dimensions of SP practices and to empirically examine the relationships among SP practices, performances, procurement sustainability strategy and initiatives within the Nigerian O&G sector"***, the researcher adopts the quantitative method as highlighted in Figure 3.1. The adoption of this method, which is considered most

appropriate and suitable for this research, will guarantee the achievement of the research purpose (Saunders et al., 2007).

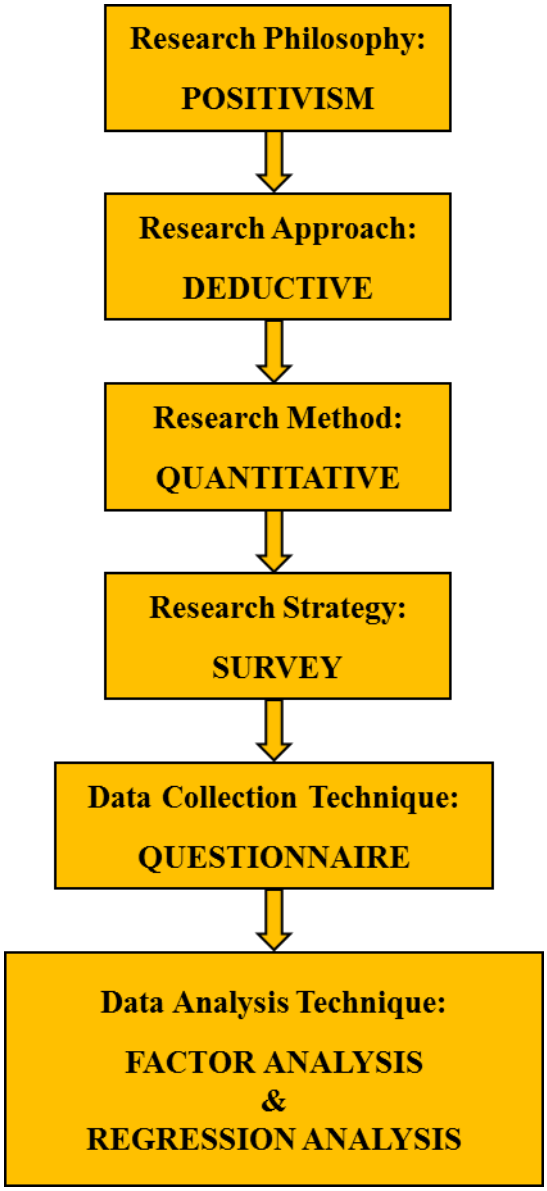

Figure 3.1: The methodology for this research

There are three main types of research methods, i.e. qualitative, quantitative and mixed methods, within business and management research (Creswell, 2014; Saunders et al., 2016). While the adoption of a single method is useful, emphasis on the adoption of multi-methods when conducting a research project has grown continuously (Holden and Lynch, 2004; Niglas, 2010). Proctor (1998), however, noted that even though this approach can be used to minimise the weaknesses associated with a single approach, it is not the ultimate choice for

all research. This is mainly because the mixed method approach has its own weaknesses (Collis and Hussey, 2014; Johnson and Onwuegbuzie, 2004). One possible best approach of the research method is that which guarantees the realisation of a research purpose. The use of a single method to solve research problems is considered suitable especially if such a method is appropriate and can help achieve the research purpose. The use of a single method approach is more economical when compared to the mix or multi-methods approach (Easterby-Smith et al., 2012). Having said this, the methodological choice of research should be determined by the nature of the research problem, what is been investigated, the proposed research questions and expected results, the research respondents and the researcher's influence on the research process (Yin, 2003).

3.6.1 Qualitative research method

The origin of qualitative research methods emanated from anthropology, sociology, humanities and evaluation (Creswell 2014). Collectively, they are referred to as a research method used within the natural setting to provide a deeper understanding and information about a research phenomenon (Saunders et al., 2007). Qualitative research has different approaches to inquiry, i.e. narrative research, grounded theory, ethnography and a case study approach. The qualitative research adopts an interpretative philosophy and, as such, researchers are required to make sense of the subjective and socially constructed meanings observed about a research phenomenon (Denzin and Lincoln, 2011; Saunders et al., 2016). Qualitative researchers seek to gain a deep understanding of phenomena by interacting with individuals (Bryman and Bell, 2007). By interacting with research participants, researchers are privileged to study and understand their intent for behaving the way they do. For instance, in a study seeking to understand the implementation of a concept or theory, researchers will not only gain an understanding of the theory implementation process it seeks but also be able to find out the reasons for such implementation. This is possible because qualitative research adopts an unstructured approach where research objects are studied in their natural settings (Denzin and Lincoln, 2011). Due to the unstructured approach of qualitative research, changes are bound to happen at any point during the research process. Qualitative research adopts an inductive approach with the aim of building theory or developing a better theoretical framework of a phenomenon. Data collected in a

qualitative research project could be in the form of words or images via in-depth interviews, semi-structured interviews or diary accounts (Collis & Hussey, 2014). However, this is subject to accessibility, because the issue of accessibility has remained one of the most challenging aspects of academic research (Malina et al., 2011). In stressing this point, Saunders et al. (2016, p. 168) stated thus: *The success of the researcher's role is dependent not only on gaining physical access to participants but also building rapport and demonstrating sensitivity to gain cognitive access to their data"*. As well as issues of accessibility, qualitative research is criticised for being too subjective, difficult to replicate and non-generalisable (Bryman and Bell, 2007). There is also an assumption that qualitative researchers may not present research findings as accurately as they should due to their subjective nature, and research findings cannot be generalised.

3.6.2 Mixed method research

The use of a mixed method approach in business research has gained popularity in recent times (Collis and Hussey, 2014). This is mainly due to the perceived shortfalls associated with both quantitative and qualitative methods of research (Holden and Lynch, 2004). Mixed method research combines both quantitative and qualitative research methods (Creswell, 2009). Mixed method research as a concept is interchangeably referred to as quantitative and qualitative methods, synthesis, integration of methods, multiple methods, convergence, mixed methodology or combined method (Tashakkori and Teddlie, 2003). It is assumed that by combining the quantitative and qualitative research methods, researchers can overcome the weaknesses associated with either method by capitalising on their individual strength (Bryman and Bell, 2007). The use of the mixed method approach is expected to reduce bias in research while also ensuring greater reliability and validity in the research (Collis and Hussey, 2014).

The idea of using mixed methods is to achieve a much better research outcome by employing both quantitative and qualitative methods (Malina et al., 2011). However, to appreciate fully mixed method research, researchers adopting this approach must be conversant with the use of both quantitative and qualitative methods (Creswell, 2014). The mixed method approach is most suitable when the use of either quantitative or qualitative

research is inadequate to fulfil a research purpose. Concerning theory development, mixed method research can adopt either an inductive, a deductive or an abductive approach (Saunders et al., 2016). In this method of research, the combination of quantitative and qualitative research can be done in several ways, i.e. concurrent (applying both quantitative and qualitative equally), sequential exploratory (qualitative, then quantitative), sequential explanatory (quantitative, then qualitative), and sequential multi-phase (qualitative, quantitative, then qualitative). Data collection in mixed method research involves adopting both qualitative and quantitative data collection techniques.

Although some academics believe mixed method research has added advantages over the use of a single research method, i.e. quantitative or qualitative (Brannen, 2005; Fellows and Liu, 2003; Malina et al., 2011; Steren, 2010), the method itself still has some disadvantages (Johnson and Onwuegbuzie, 2004). For instance, mixed method research requires more time and resources (Creswell, 2014). In addition, the issue of conflicting philosophical assumptions also arises when combining quantitative and qualitative research methods (Bryman and Bell, 2007). This issue of conflicting philosophical assumptions is of real concern to the researcher in this study because the quantitative and qualitative research methods are distinctly two different research methods guided by different research philosophical assumptions (Creswell 2009; Easterby-Smith et al., 2012; Saunders et al., 2016).

Whereas mixed method research is argued to be a superior method when undertaking research, one must bear in mind that this cannot be the case in all research (Dubois and Gadde, 2014). In fact, Dubois and Gadde (2014) and Hurmerinta-Peltomäki and Nummela, (2006) argued that mixed methods are not the best choice of research approach. Given the above arguments and the aims of this research, the use of the mixed methods approach is considered unnecessary and unsuitable. The awareness of its irrelevance and unsuitability is in accordance with the mixed method research literature where it is argued that mixed methods are only essential when they are an integral part of the research strategy, but not to correct research that has been badly designed (Collis and Hussey, 2014).

3.6.3 Quantitative research method (this research method)

This research adopts a quantitative method. This is because it is considered the most suitable and appropriate method for this research. This decision was made with the research purpose in mind. The quantitative research method is closely linked with the positivism stance adopted in this research. The quantitative method involves the collection of numerical data for statistical analysis (Easterby-Smith et al., 2012). Quantitative research is focused on collecting factual data, studying relationships between facts and examining how research findings confirm or disconfirm previous research (Fellows and Liu, 2015). Creswell (2009) described the quantitative research method as a technique used for testing objective theories by examining links amongst variables. The quantitative research method has its roots in natural sciences, where numerical data are collected and analysed to acquire real knowledge (Bryman and Bell, 2007). Data collection techniques used in the quantitative method are often predefined and extremely structured in such a way that data collected cannot be manipulated, hence findings are predictable (Saunders et al., 2016).

Similarly, to the qualitative research method, the quantitative research method utilises a few research strategies, i.e. experiments and surveys, in collecting data (Creswell, 2014). Research findings from quantitative research can be generalisable, i.e. from the specific sample population to a broader population. The quantitative research method uses a deductive approach where researchers develop and test hypotheses or answer research questions (Bryman and Bell, 2007; Saunders et al., 2016). The main steps involved in a quantitative research process were highlighted by Bryman and Bell (2007, p. 155) and reproduced hereunder as Figure 3.2. The steps highlighted therein, are the steps followed in this research. This approach is used to sequentially respond to the research objectives developed in this study using exploratory factor analysis, multiple regression and confirmatory factor analysis.

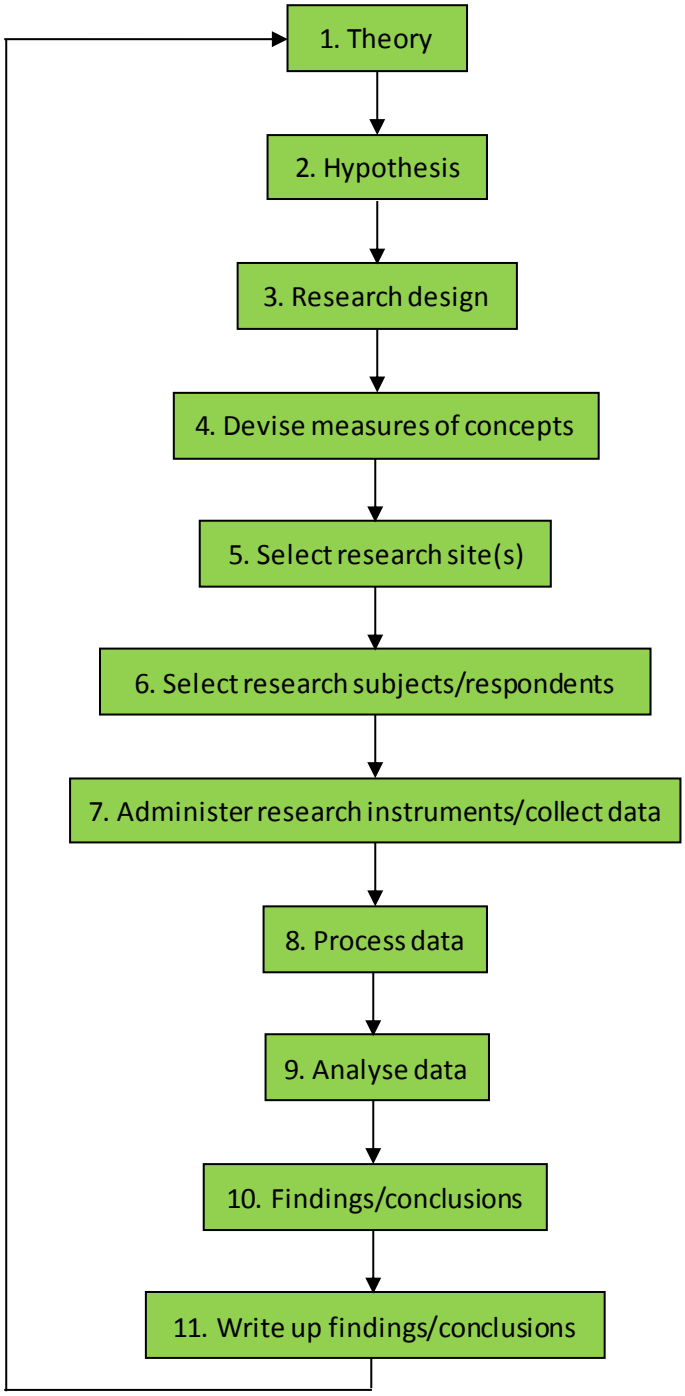

Figure 3.2: The process of quantitative research
Source: (Bryman and Bell 2007, p. 155)

Given the nature of this research and the information it seeks, the quantitative research method is considered most suitable. As indicated in the research questions shown in Table 3.2, this research is explanatory in nature for the following reasons. Firstly, this research intends to gain insight into the exact nature and extent of SP practices within the Nigerian O&G sector. In doing so, the relationship among these practices is examined, as well as the

influence of sustainability initiatives on SP adoption. Due to the ambiguity around SP adoption within the Nigerian O&G sector, an explanatory approach to investigate the implementation and subsequent impacts of SP practices within the sector is necessary. Causal links are also identified between the variables in this research, which confirm the explanatory nature of this research (Yin, 2003). Secondly, the research questions, which mostly begin with 'what' and 'how', are closely associated with explanatory studies. Thirdly, SP practice is a new practice especially within the Nigerian O&G sector where there is a shortage of empirical studies to confirm the existence of SP practices. The researcher also states that explanatory studies are in line with the quantitative research method adopted in this research (Saunders et al., 2016).

Table 3.2: Research questions

RQ1	What are the nature and extent of SP dimensions within the Nigerian O&G sector?
RQ2	How important are SP dimensions to firms within the Nigerian O&G sector?
RQ3	What are the drivers and barriers associated with the adoption of SP practices within the Nigerian O&G sector?
RQ4	What are the underlying relationships among the SP practices explored in this research?
RQ5	What are the relationships among adopted SP practices and sustainability initiatives, i.e. ISO 14001 certification and UN Global Compact?
RQ6	What are the relationship among adopted SP practices and SP strategy?
RQ7	Do the adoption and implementation of SP practices within the Nigerian O&G sector improve practising firms' performances?

While there are no right or wrong methods of carrying out a research project, academics emphasised the adoption of the most suitable and appropriate methods when conducting an academic research project (Collis and Hussey, 2014; Silverman 2013). Although there is an indication that quantitative method is dominant within management research (Creswell, 2014), Blumberg et al. (2014, p. 148) argued thus: *"…there is no such clear predominance of qualitative and quantitative studies"*. Although SP practice is new and thus its adoption needs more clarification in the context under study, which suggests a qualitative stance (Creswell, 2014), the researcher argues that SP practices have been addressed in other industries and contexts where their variables had been established and confirmed (Brammer and Walker, 2011; Mansi, 2015; McMurray et al., 2014; Walker and Brammer, 2009).

Nevertheless, a quantitative research method can also be explorative in nature as presently utilised in this present research (Blumberg et al., 2014).

This method is commonly adopted among renowned academics within sustainability and SP empirical research (Ahmad et al., 2016a; Brammer and Walker, 2011; McMurray et al., 2014; Meehan and Bryde, 2011; Musa et al., 2013; Walker and Brammer, 2009; Yusuf et al., 2013). This fact, therefore, indicates that the researcher is adopting already tested research approaches. There is no doubt that the use of qualitative or mixed methods is widely appreciated due to the criticisms attached to quantitative research (Bryman and Bell, 2007). However, the quantitative method adopted in this research is believed to be suitable because it affords the researcher the opportunity to obtain data from a large sample that can be easily analysed and generalised (Saunders et al., 2016). This method is very flexible due to its ability to reach out to its intended respondents through different means, i.e. face-to-face, telephone, online and post (Kothari, 2004). The adopted research method is in line with the chosen philosophy and approach and therefore is the most suitable because the research purpose can be realised with it (Denscombe, 2010). Depicted in Table 3.3 below are the main characteristics of qualitative, quantitative and mixed methods research.

Table 3.3: Qualitative, quantitative and mixed methods procedures

PROCEDURES			
Characteristics	**QUALITATIVE METHOD**	**QUANTITATIVE METHOD**	**MIXED METHOD**
Data collection instructions	• interview • observation • bibliographical and documentary survey	• Questionnaire	• Concurrent with one single instrument quant/qual • Sequential; more than one instrument used in distinct moments
Structure of the instrument	• Interview schedule with open questions or sequence of topics and subtopics • Observation schedule	• Fixed standard questionnaire, with structured questions and alternative answers; may include some open-ended	• Fixed standard questionnaire, integrated to interview schedule; observation

	• Sets of concepts and compilation schedule	questions (optional)	schedules; and set of concepts and compilation schedule
Kind of data record	• Narrative text, audiovisual media, summary of bibliographical/ documentary research	• Dichotomic, scales and multiple choice; literal transcriptions of answers to open-ended questions	• Integration of techniques; alternative predefined answers, narrative text, sound records, photographs, film shooting, and documents summary
Mode of data processing	• Data files (interviews, documents etc) • Data organized in categories • Files of bibliographical/ documentary summaries	• Statistical database • Files of bibliographical/ documentary review notes	• Statistical database • Files of interviews, testimonies, files of documents • Data organized in categories • Files of bibliographical/ documentary summaries
Data analysis and interpretation (incorporating theoretical references and literature and documentary review)	• Explanation of the narrative structure of texts • Contextualization and interpretation of the meaning of images and sounds • Content analysis of documents and testimonies	• Behaviour of variables, indicators and indices • Descriptive of inferential statistics • Univariate, bivariate or multivariate analysis • Elaboration of statistical tables, charts and graphs • Statistical tests	Integrated analysis of qual/quant data • Findings presented as tables, charts and graphs, triangulated with excerpts of testimonies, narratives and reports • Triangulation of text and audiovisual documents

Source: Steren (2010, p. 15)

3.7 Research strategy

Research strategy can be described as the methodological link involved in a research project (Denzin and Lincoln, 2011). In Saunders et al. (2016, p. 177) research strategy is defined *"as a plan of how a researcher will go about answering her or his research question"*. It is a framework used in collecting and analysing data in research (Bryman and Bell, 2007). The choice of a research strategy is steered by the research objectives and research questions and must be consistent with the adopted research philosophy, approach, purpose and methods. In addition, ethical issues, response rate, available resources, and access to respondents are some of the essential factors that determine the research strategy. Having said this, it is the responsibility of the researcher to make sure the chosen research strategy can provide useful insights needed to answer his or her developed research questions. The main aim of this research is to investigate SP practices within the Nigerian O&G sector as repeatedly mentioned in this thesis. However, in exploring SP practices, the research intends to conduct correlation and regression analysis to assess the links amongst the research variables as set out in the research questions and intended hypotheses.

There are several research strategies used within quantitative and qualitative research, e.g. experiment, survey, archival research, case study, ethnography, action research, grounded theory, narrative inquiry (Bryman and Bell, 2007; Saunders et al., 2016; Yin, 2003). In line with the research questions and the discussion provided above, a survey strategy is adopted for this research. This is because it is deemed most suitable considering the purpose of this research and the chosen research methods. The survey strategy is also consistent with the nature of this research, which is intended to answer questions of "what" and "how" used to investigate and evaluate contemporary events, such as, SP Practices in this research (Yin, 2003).

3.7.1 Survey (this research strategy)

Survey strategy is closely associated with the quantitative research method. It is commonly used to collect primary or secondary data from a sample with the aim of generalising its results to a population (Collis and Hussey, 2014). The survey strategy which is used to answer research questions that start with 'what', 'how', 'who' and 'where' is considered the

most prevalent strategy within business and management research (Saunders et al., 2016). The survey strategy adopted is in line with the deductive approach used in this research for testing existing theories. Survey strategy is also frequently used in explanatory research where a research population is large. This is possible with the use of a questionnaire, which is considered more economical for reaching out to a large population. A survey by questionnaire permits the collection of standardised quantitative data that can be analysed statistically to identify the relationship between variables (Robson, 2011). Whereas there are other popular survey methods, e.g. structured interview and structured observations, which can be conducted in-person, face-to-face or over the telephone (Kelley et al., 2003), these methods are not deemed suitable for this research.

As noted earlier, the survey strategy by questionnaire is adopted in this research. The adoption of a survey by questionnaire is consistent with this research philosophy, approach and method. Considering the scope of this research, a survey by questionnaire is deemed the most appropriate data collection technique, because it will afford the researcher the opportunity of reaching out to the research sample, which is made up of O&G firms within the upstream sector. The use of a survey by questionnaire is also popular in business and management research and used in similar studies (Ahmad et al., 2016b; Brammer and Walker, 2011; McMurray et al., 2014; Walker and Brammer, 2009; Yusuf et al., 2013) and in the country under study (Musa et al., 2013; Oyewobi et al., 2017). Sustainability practice can be measured and as such, a survey by questionnaire is considered suitable. In addition, a survey by questionnaire is more economical, easy to distribute and distributed simultaneously to research respondents. Besides, conducting interviews with procurement professionals on sensitive issues of sustainability, which would likely take more time, was deemed unfeasible, considering their busy schedules.

In addition, this research seeks to establish the adoption of SP practices across the Nigerian O&G sector, understand the underlying relationships among these practices and whether such practices can lead to improving firms' performances and corporate sustainability. All these objectives can be achieved with the chosen research strategy (Robson, 2011; Saunders et al., 2016) because the survey intends to adopt an established scale that has been utilised

and validated for SP studies by prominent academics. The protocol followed in this research in line with the research objectives as depicted in Table 3.4

Table 3.4: Research protocol

Research objectives	Data required	Research methods
OBJ1: To identify current state, drivers and barriers of SP practices	Qualitative and quantitative data	Literature review & Questionnaire
OBJ2: Explore the underlying relationships among SP practices	Quantitative data	Questionnaire & exploratory factor analysis (EFA)
OBJ3: Examine whether sustainability initiatives drive firms to adopt SP practices	Quantitative data	Questionnaire & multiple regression
OBJ4: Ascertain whether having clear SP strategy drives firms to adopt SP practices	Quantitative data	Questionnaire & multiple regression
OBJ5: Ascertain whether firms' corporate characteristics have an influence on SP adoption	Quantitative data	Questionnaire & multiple regression
OBJ6: To establish whether SP practices impact on firms' performances	Quantitative data	Questionnaire & confirmatory factor analysis (CFA)

However, it will be an oversight to assume that a survey strategy is without drawbacks. Some of the main drawbacks of the survey questionnaire are the low response rate and non-response bias associated with it and its inability to obtain in-depth information (Kelley et al., 2003; Saunders et al., 2016). These drawbacks, as they relate to this research, were minimised as argued in the response rate subsection, where an additional measure was taken to improve the response rate and to minimise non-response bias in this research.

3.8 Time horizon

Establishing the time horizon adopted in research is crucial for several reasons. For example, it demonstrates the researcher's knowledge of the research concepts, research process, and the commitment of the researcher to provide in-depth information about the research conducted. Saunders et al. (2007) noted that because time horizon is independent of the methodological choices made in research, researchers should consider reporting on the time horizon they adopted. Time horizons are categorised into longitudinal and cross-sectional,

with longitudinal studies undertaken and repeatedly over a long period of time, whilst the cross-sectional studies are conducted within a shorter period, mainly due to the research phenomena being observed. Given the research purpose and time constraint, this research will be cross-sectional. Cross-sectional design involves the collection of quantitative or qualitative data at a single point in time (Bryman and Bell, 2007). Studying the research problem over a long period is pointless because it is not an objective in this research, neither would it lead to an added advantage. The cross-sectional time horizon is the most prevalent time horizon applied in management research. The is evident in most of the sustainability and supply chain management research conducted around the world. The cross-sectional method has been linked to several advantages, e.g. time-efficient, cost-effective and feasible to undertake (Bryman and Bell, 2007).

Although the time horizon is independent of the methodological approaches of research, the researcher emphasis that the cross-sectional approach adopted in this research fits well with the research philosophy, approach, strategy and method used. Furthermore, the cross-sectional approach can be used in all types of research, including explanatory research (Saunders et al., 2016). This choice for the cross-sectional against the longitudinal approach is in keeping with the research objectives, which can be achieved within a specific time frame, rather than a continuous study of the research phenomenon as in the case of longitudinal approach. In this research, exploring SP practices within the Nigerian O&G sector involves carrying out a detail investigation of the practices implemented (if any), what influence or deter the implementation of this practices, the relationship between these practices and the possible benefits of implementing these practices. The researcher strongly believes these objectives can be achieved within a specific time frame. More so, the PhD programme has a time frame of 3-4years, which therefore means the researcher is restricted in terms of the time needed to complete this research.

The fact that this research does not seek information about future practices or their effects on organisational performance, rule out the longitudinal approach which is mostly used to gain an understanding of phenomena by studying the same over a long period of time.

3.9 Data collection technique

The data collection technique employed in research is mainly determined by the type of data sought, the researcher's knowledge, and the availability of resources (Bryman and Bell, 2015). This research utilises both primary and secondary data. The secondary data (literature review, firms' sustainability reports, publications etc.) provided the framework on which this research is formed (Yusuf et al. 2013). To collect primary data, the researcher obtained permission from the Department of Petroleum Resources (DPR) Nigeria, the regulatory body in charge of the Nigerian O&G sector. As discussed above, a standard questionnaire was used in this research to obtain primary data from selected and willing respondents within the Nigerian O&G upstream sector, which comprises of 118 international oil companies and national oil companies (DPR, 2015). Respondents were sent formal *'request to participate'* letters before the collection of data. The standard self-completed questionnaire designed with Bristol online survey software was sent via e-mail to procurement professionals within the Nigerian O&G sector. This method is considered one of the fastest, efficient and most cost-effective ways of collecting data compared to other methods (Alan, 1998; Fricker and Schonlau, 2002; Sue and Ritter, 2007).

However, due to the low response rates associated with surveys and research in developing countries (Musa et al., 2013), the questionnaire was also administered in person, where possible, to some readily accessible respondents to boost the response rate (Wright, 2005). The chosen method is the most suitable way to obtain the data sought in this research considering its context. This is because, to the best of the researcher's knowledge, there is a lack of reliable address systems like that of developed countries. There are also limited viable and accountable standard mail delivery services in the country of study. In view of this, and considering the position of this research, which is concern with sustainability issues in the country of study, the use of an online survey is more suitable and environmentally friendly (Alan, 1998; Meehan and Bryde, 2015; Sue and Ritter, 2007). From a sustainability viewpoint, a mailing survey has an environmental implication, and therefore, is rejected in this research. In addition to the above-mentioned advantages, the online survey appears to be the most appropriate form of data collection given the poor infrastructure of the country under study. Although there are suggestions that online surveys have lower response rate

when compared to conventional mail method (Fricker and Schonlau, 2002), the adoption of the online method is more appropriate considering the circumstances already highlighted above.

3.9.1 Questionnaire survey

The questionnaire is a standardised set of questions administered to research respondents (Sekaran and Bougie, 2009). The questionnaire can comprise close-ended or open-ended questions, with a set of answers already provided, from which respondents are asked to choose in the case of close-ended questions (Robson, 2011). In the case of open-ended questions, respondents are encouraged to provide answers based on their views and perceptions of the issues presented (Saunders et al., 2016). The questionnaire is commonly used when trying to identify or describe certain organisational practices. It is also used where a researcher is aware of the main issues within a research phenomenon and how significant variables can be measured (Sekaran and Bougie, 2009). Furthermore, the extant literature has provided ample evidence to suggest that the questionnaire is more appropriate in this sort of research, where the relationship between variables is examined.

There are two main types of questionnaire, i.e. the self-completed questionnaire and structured interviews (Bryman and Bell, 2007). With the self-completed questionnaire, which is also referred to as a self-administered questionnaire by Saunders et al. (2007), respondents complete the questionnaires themselves. While, with the structured interviews, the researcher has a face-to-face encounter with respondents where he or she asks standard questions then completes the questionnaire with respondents' responses (Saunders et al., 2016). The steps used in this research are highlighted in bold as shown in Figure 3.3. Considering the busy schedules of procurement professionals, especially in the O&G sector, which is experiencing massive staff redundancy, adopting interviews or other methods would be difficult and unfeasible as previously explained. The self-completed questionnaire can be distributed via the internet or mailed to respondents to complete. The research purpose, research questions, data sought, proposed respondents and sample size determine the choice of a questionnaire approach for research (Saunders et al., 2016). These factors are given careful consideration in this present research before the researcher settles for the

use of a self-completed questionnaire, which is developed based on the literature review and sent through the internet as the most suitable and appropriate data collection technique for this research.

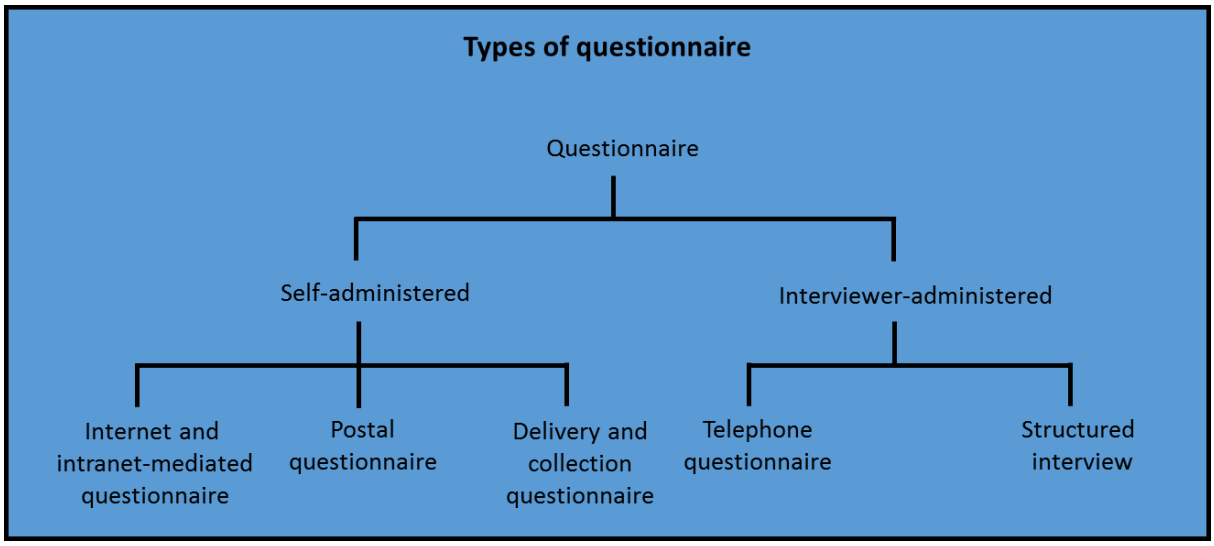

Figure 3.3: Different types of questionnaire
Source: Saunders et al. (2009, p. 357)

In addition to the above arguments, the researcher states that there are several advantages associated with the self-completed questionnaire. For example, this form of the questionnaire is quicker to distribute, can be easily distributed to large respondents, it is inexpensive to distribute, and convenient for both the researcher and respondents involve (Bryman and Bell, 2007; Robson 2011; Saunders et al., 2007). This approach has been used in similar SP studies (Grandia, 2016; Islam et al.,2017a; McMurray et al., 2014; Meehan and Bryde, 2015; Walker and Brammer, 2009)

3.9.1.1 Online questionnaire survey

As noted earlier, the main method of distributing the research questionnaire was via the internet using the Bristol online survey software. In addition to the reasons provided earlier, it is emphasised that this method was deemed most appropriate considering the complexity in gathering data within the O&G sector (Ahmad et al., 2016a; Musa et al., 2013; Yusuf et al., 2013). The Nigerian O&G sector has firms scattered all over the country (although their main hub is Port Harcourt, Lagos, Warri and Abuja) and travelling around the country would have been unfeasible for the researcher, who resides in the UK. Also, this method fits well with

the researcher's budget and timeframe. Furthermore, this method accords the researcher the added advantage of directly contacting the appointed procurement professional who has the appropriate capacity and knowledge to complete the questionnaire. Apart from the environmental benefits, the internet-mediated questionnaire can reach many respondents quicker than any other form. See Grandia (2016), Hasselbalch et al. (2014) and Meehan and Bryde (2015) where online surveys have also been used.

The other methods of the self-administered questionnaire are not feasible in this research due to reasons highlighted earlier, e.g. unavailability of reliable postal services, geographical locations, infrastructural and security challenges. In addition, since the web link of the questionnaire is emailed directly to the procurement professionals, there is certainty that they were completed by the intended respondents with the knowledge and experience of SP practices within their respective firms. Furthermore, the anonymity of respondents can be guaranteed using the online survey approach (Malhotra et al., 2012). Although the stance of the literature with regards to online surveys are mixed (Fricker and Schonlau, 2002; Granello and Wheaton, 2004; Wright, 2005), this survey approach is the most suitable approach available to the researcher because it is cheaper, less time consuming and flexible. Depicted in Table 3.5 are some of the advantages and disadvantages of only surveys.

Table 3.5: Advantages and disadvantages of Online survey

Online surveys	
Advantages	**Disadvantages**
✓ Speed	× Sampling frames
✓ Cost	× Access to the web
✓ Quality of response	× Technical problems
✓ No interviewer biases	
✓ Data quality	
✓ Contact with a certain target group	

Source: Malhotra et al. (2012, p. 330)

Whereas limitations, such as sampling and accessibility challenges are common with online surveys, this research took extra measures to reduce such challenges. For example, with

regards to sampling, the sampled firms were initially contacted to seek their participation, and it was upon their response, the questionnaire was sent out with specific instruction on eligible respondents. Also, the issue of accessibility was dealt with by following the relevant ethical process, which involves obtaining approval from the University of Salford and the regulatory body responsible for the Nigerian O&G sector – DPR. In addition, the sampled firms' representatives had access to internet and email accounts (Granello and Wheaton, 2004). In addition, communications were done using the official University email address attaching approval letters from both the University of Salford and DPR to increase participation.

3.9.1.2 Questionnaire development

The questionnaire used in this research is developed from a reliable and established purchasing social responsibility (PSR) scales of Carter and Jennings (2004), which has been employed and validated for SP studies by prominent academics (Brammer and Walker, 2011; Meehan and Bryde, 2015; Islam et al., 2017a; Mansi, 2015; McMurray et al., 2014; Walker and Brammer, 2009). However, to cover the robustness of SP practices, this research also consulted the sustainable procurement disclosure index (SPDI) developed by Mansi (2015), which integrated the PSR scales. The firms' performance measurement aspect of the questionnaire was developed using Yusuf et al.'s (2013) performance measurement scale, which was used for a similar study of the O&G sector. This approach is guided by the extant literature review conducted in this research to determine the underlying dimensions of SP practices and performance measures. This approach is also common within the literature in identifying and developing suitable research questions in research studies. The modification of existing research constructs has been advised to suit research scope, context and purposes (Bryman and Bell, 2015; Esfahbodi et al., 2016; Walker and Brammer, 2009; Yusuf et al., 2013).

However, the use of established scales in scholarly research is restricted to those that have been reliably tested. For example, it is advised that only scales that have been utilised in studies that reported good validity and reliability should be adopted. It is in line with this thought the scales highlighted above have been adopted, although the research objectives

were also considered in developing the research questions. Considering the general adoption of the PSR scales by prominent academics as a proxy for SP practices (Brammer and Walker, 2011; Mansi, 2015; McMurray et al., 2014; Meehan and Bryde, 2015; Islam et al., 2017b; Roman, 2017; Walker and Brammer, 2009), it is argued that the use of these scales in this research is appropriate.

The questionnaire in this research (see Appendix 2) is divided into 3 parts (Part A-C), with part A focusing on the respondents' profiles, part B focusing on SP practices, and part C focusing on SP performance measures. In part A the firms' characteristics are also covered, which are used as control variables in this research. Part B contains preliminary questions on SP practices and the main research constructs of 55 questions for operationalising SP. The preliminary questions in part B offer respondents the opportunity to highlight key drivers and barriers to SP practices (the open-ended questions) and for how long they have implemented these practices. The 55 main constructs used in this research utilised a 5-point Likert scale (strongly agree = 5, agree = 4, not sure = 3, disagree = 2 and strongly disagree = 1). This is consistent with the original PSR scale (Carter and Jennings, 2004) and other sustainability studies (Ahmad et al., 2016a; Hasselbalch et al., 2014; Musa et al., 2013; Walker and Brammer, 2009; Yusuf et al., 2013). Furthermore, the questionnaire was designed in line with the research questions and ultimately the research objectives. Consideration was also given to the five principles of good questionnaire design identified by Easterby-Smith et al. (2012). To test the reliability and validity of the questionnaire as it applies to the O&G sector, a focus group comprising both researchers and practitioners were consulted. This process is elaborated on in the pilot study section.

3.9.2 Pilot study

To ensure the face validity and reliability of the research questionnaire in achieving the aims of this research a pilot study was done, which consisted of both academics and professional experts in the field, to pre-test the questionnaire, as noted earlier. The need to conduct pilot tests have been stressed in the methodology literature (Baker and Foy, 2008; Granello and Wheaton, 2004; Rowley, 2014). This additional effort ensures the questionnaire is logically developed, flows accordingly, and not too complicated to complete by potential

respondents. In this research, a pilot study was done using a group of researchers and practitioners through networking in a conference attended by the researcher, where aspect of this work was presented. The pilot study included persons from Nigeria and the UK who have direct links with the O&G sector, in both industry and research capacity and are familiar with sustainability issues within the O&G sector. See Roman (2017) where a similar approach had been used.

The pilot study resulted in several editing of the research questionnaire to reflect current issues of SP practices in relation to the O&G sector as advised by the pilot group before it was finally launched. In addition, the questionnaire was also reviewed by a professor within the Salford Business School in an assessment during my PhD programme, who thoroughly read through the questionnaire survey and made hand-written corrections where required. The piloting test is particularly useful in this form of research where online survey approach has been utilised to ensure the web link to the questionnaire survey is valid and can be accessed from different locations (Granello and Wheaton, 2004).

3.10 Sampling methods

There are different sampling approaches available to researchers in both interpretivist and positivist research. The significance of adopting an appropriate sampling method when conducting quantitative research is documented across methodology literature. For example, Lee and Lings (2008) noted that to be able to generalise research findings, researchers must ensure their study sample is a representative of the population. This is necessary since surveying an entire population in large quantitative research, such as this current research, is unrealistic or difficult (Saunders et al., 2016). In order words, using a sample of the population or target population being observed, Figure 3.4, is considered more feasible. It is, therefore, important that the population and target population, as in this current research, are clearly defined when considering the sampling methods. That said, sampling can be problematic in quantitative research if the right technique is not employed. To reduce sampling errors or bias researchers are often advised to consider probability sampling against the non-probability sampling technique – the two main sampling techniques (Lee and Lings, 2008; Saunders et al., 2016).

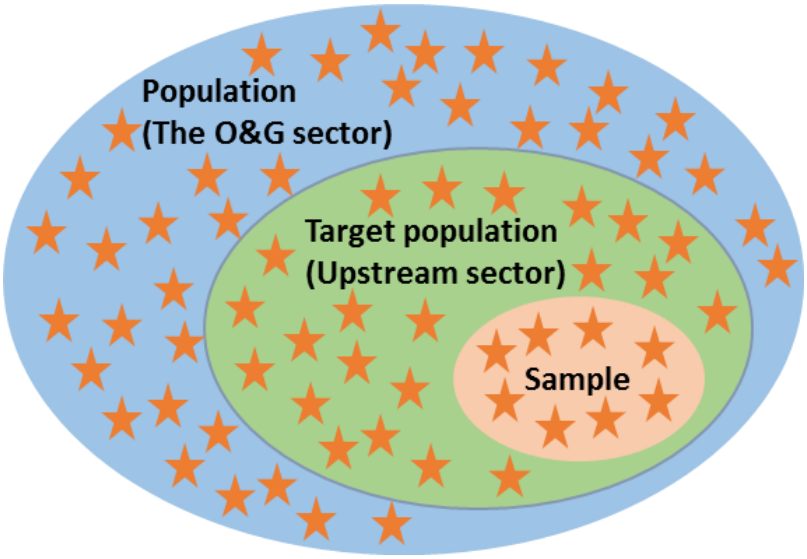

Figure 3.4: Research population, target population and sample
(Adapted from Saunders et al., 2016, p. 275)

3.10.1 Sampling technique

Probability sampling is a sampling technique where respondents are assumed to have equal chances of participating in the study. This sampling technique is arguably more suitable in this research where the questionnaire survey is been used (Saunders et a., 2016). This sampling technique also makes a generalisation of statistical findings to the population or target population (an ambition of this research) valid and authentic (Lee and Lings, 2008). Although generalisation can also be achieved with non-probability techniques, this has limitation. For example, researchers cannot generalise on statistical grounds (Saunders et al., 2016). Considering the statistical analysis approach of this research, the non-probability sampling technique is deemed inappropriate in this research. Also, it is important that data for this research are collected using an approach which gives firms within the upstream O&G sector an equal opportunity to participate. Whereas the geographical location, security and infrastructure challenges may deter this approach, the researcher had adopted the online survey technique to mitigate this, by electronically sending an invitation to participate in this research to firms listed by DPR as operating within the upstream sector.

The probability sampling technique has four main methods, e.g. simple random, systematic random, stratified random and cluster sampling methods. A fifth method is the combination

of the four methods highlight herein, as a multi-stage sampling method (Lee and Lings, 2008; Saunders et al., 2016). These sampling methods are adopted depending on the research focus, sampling frame and planned data analysis. However, the simple random method is very straightforward when compared to the other methods. In addition, the stratified random and cluster sampling methods are not relevant since this research is not keen about the respondents' attributes and not intended to study the entire Nigerian O&G sector, that includes the downstream sector which comprised of thousands of petrol stations. The systematic random sampling is also not appropriate in this research, and to some extent considered to be a non-random approach by the researcher.

Most importantly, this research sampling frame is 118 (numbers of firms operating in the upstream sector), an element which is considered in deciding the sampling method for this research. As well as the sampling frame of 118, the researcher assessed the research aims and objectives, the research population, the geographical locations of prospective respondents and resources available for conducting this research. After careful assessment, with more emphasis on the research aims and objectives, the simple random sampling method was adopted. This method allows the selection of the research respondents in a random format. For instance, developing a database of the population (a list of all firms including relevant information) and assigning numbers to each case, which is thereafter selected randomly from the list. Also, this method is consistent with the literature where the generalisation of statistical findings is intended (Grandia, 2016; Islam et al., 2017b; Oyewobi et al., 2017; Roman, 2017; Ruparathna and Hewage, 2015). Given the economic and time limitations in this study, the simple random sampling method is deemed to be the most suitable method. The issue of high cost noted to be associated with simple random sampling method is only applicable in large samples, and therefore not relevant in this research since the sample size is not large.

3.10.2 Population

According to Collis and Hussey (2014, p. 197) *"a population is a body of people or collection of items under consideration for statistical purposes"*. These authors stressed further that an entire population can be selected for analysis if the population is small, or else researchers

should select a random sample in the case of a large population. This research is designed to investigate the adoption of SP practices by firms within the Nigerian O&G sector. To achieve this, primary data is sought from within the Nigerian O&G sector. The sector is characterised by firms of different sizes and expertise, with activities in the two main streams of the sector, i.e. upstream and downstream. As indicated in this research, this study focuses on the upstream sector for reasons already outlined in section 1.2 of the introduction chapter. For example, the upstream sector comprises serious activities with greater benefit (Al-Naumani and Rossiter, 2015), and faces huge environmental, social and economic challenges compare to the downstream (Black, 2010; Chan, 2011; Musa et al., 2013). The upstream sector consists of O&G operators and servicing firms whose main activities are the exploration and production of petroleum products from which the research sample is drawn. Focusing on the upstream sector is appropriate in view of the role it plays in the exploration and production of petroleum product.

Due to the absence of a formal directory for operators and servicing firms within the Nigerian O&G upstream sector, the researcher relied on the list of firms as published by the DPR, the parastatal responsible for the operations of O&G activities in Nigeria (Vaaland et al., 2012). A total of 118 international and national oil companies were identified to be operating in the upstream sector (DPR, 2015) and therefore reported as the research population. The individual firm is expected to have more than 1 procurement professional within its operations considering the scale of the procurement function of O&G firms. However, with a focus on firms' SP practices, not all procurement professionals within an individual firm are required to participate. For clarity, in this research, only one respondent from each firm is required to complete the questionnaire. The small number of firms within the upstream sector confirm the challenges of the sector, which also includes huge upfront financial commitments. This ultimately led to a limited number of procurement professionals engaged in this research.

This approach is adopted where it is difficult to survey a whole research population (Brewerton and Millward, 2001). The population according to Sue and Ritter (2007, p. 25*) "… is the entire group of individuals, groups, or objects to which you would like to generalise*

your research results—for example, citizens of a country, students at a university, or employees of a company". In view of this definition, and considering financial and time constraints, accessibility issues and the size of the Nigerian O&G sector, a survey of the entire population is clearly impossible (Saunders et al., 2016). For these reasons, a *'sample'* was drawn from the upstream sector to participate in this research.

3.10.3 Sample size

A sample is described as a subset of a population (Collis and Hussey, 2014; Sue and Ritter, 2007). The sample for this research is selected randomly, as noted in the sampling technique section, giving all firms within the upstream sector equal opportunity to participate, thereby reducing sample bias (Creswell, 2014). However, consideration was given to issues of accessibility and availability of information on the firms. Since there is a lack of reliable database directories as noted earlier, information, such as postal addresses, email addresses, telephone numbers and fax numbers of the sampled firms were manually gathered to create a database of the sampled firms.

After this process, respondents who are procurement professionals, i.e. procurement directors, procurement managers, purchasing officers, buyers, procurement leads and procurement supervisors, are contacted from the sampled firms using random sampling technique (Easterby-Smith et al., 2012). Because the intended respondents are procurement employees of the sampled firms, it is reasonably assumed that they have knowledge of their SP practices and therefore in the best position to complete the questionnaires. According to Clegg (1990) as cited in Collis and Hussey (2014, p. 198) researchers should consider the following when designing their sample size:

- The statistical analysis planned
- The expected variability within subsets in the sample
- The tradition in your research area regarding what constitutes an appropriate sample size.

The above yardstick, although brief somehow reflects those proposed by Saunders et al. (2009). In relation to this research, the issue of sample variation is not applicable, because

the prospective respondents have been limited to procurement professionals with the knowledge and experience of their firms' procurement practices. The statistical analysis planned for this research, e.g. EFA, multiple regression and CFA has different criteria in terms of sample size, especially when used with different software packages. For example, the sample size recommended for conducting an EFA analysis varies depending on what is been used to assess sample adequacy (Field, 2013; Jung and Lee, 2011; MacCallum et al., 1999; McNeish, 2017). However, there seem to be a consensus that sample size for EFA should be around 100, though a sample size of 50 or less can yield good results if high communality, a high number of variables and fewer factors are achieved (de Winter et al., 2009). With regards to the CFA analysis, this study used structural equation modelling (SEM) technique performed with SmartPLS. The minimum recommended sample size when using SmartPLS is between 30 – 100 (Chin and Newsted, 1999; Reinartz et al., 2009).

In line with the above discussions and recommendations, the entire population (118 O&G upstream firms) was considered as the sample size for this study. This was the only way of ensuring a reasonable sample size could be achieved. The selection of the entire population for analysis is consistent with the methodology literature (Collis and Hussey, 2014). In addition, the sample size of 118 is within and above the recommended sample size needed for the EFA and CFA analysis (de Winter et al., 2009; Hair et al., 2011; Jung and Lee, 2011; Reinartz et al., 2009).

3.10.4 Unit of analysis

As indicated in the preceding sections, the firms within the upstream O&G sector are selected as the unit of analysis in this research. For example, the number of procurement professional allowed to complete the questionnaire has been restricted to one. This criterion was boldly written in the invitation to participate letter as well as the information sheet to ensure compliance. Using the firms as a unit of analysis was an easy decision considering the research objectives and subsequent survey questions used in this research. The overall aim of the research is to gain an understanding of the firms' involvement in sustainability issues, especially their procurement functions. With a focus on SP practices, the research respondents have been restricted to only procurement professionals, especially those with

managerial responsibilities, within the sampled firms. It is assumed that procurement professionals are more likely to have the knowledge and awareness of sustainability initiatives been implemented across the procurement functions of their firms. This approach is in line with the business management and sustainability literature (Hasselbalch et al., 2014; Islam et al., 2017b; Roman, 2017; Young et al., 2016)

To ensure that only one response was received from each firm, the researcher upon receipt of the returned questionnaires, carefully examined them making sure there was no duplication of firms' name – the respondent's characteristic used to monitor this aspect. This process further ensures that only one representative is accounted for per firm, thereby helping to preserve the firms as the unit of analysis in this research.

3.11 Questionnaire distribution

The internet-mediated survey approach was adopted in this research as stated earlier. To determine the validity of the firms' database created in this research, an invitation to participate was sent out to the firms, which also requested for a valid email address of their representatives from within their procurement function. This initial contact led to the establishment of 96 firms to whom the questionnaires were sent. This approach had also been employed by Delmonico et al. (2018) in their SP study of Latin America.

In line with online survey approach, the questionnaire was uploaded on the web using the Bristol Online Survey (BOS) website now called Online Surveys. BOS is widely used across the academic field especially in large quantitative research where the collection of primary data is the focus. However, the questionnaire was edited after the pilot study and thorough vetting by the researcher. The link to the final copy of the questionnaire was then sent alongside the invitation to participate, research information sheet, letter of approval from DPR, and ethical approval letter from the University of Salford to the sampled firms in August 2016. The e-mail to prospective respondents was sent using the official university email address to add some sort of assurance and formality to the distribution of the questionnaire to encourage respondents' participation which could also lead to increase

response rate. It is also important to note that the correspondences attached to the questionnaire were all on letterheaded papers.

Some relevant information about the research scope, its importance as well as ways of maintaining confidentiality and anonymity were highlighted in the invitation to participate letter, while the research aims and objectives were specified in the research information sheet. Information about the completion and how long it would take to complete the questionnaire – approximately 20 minutes, and what the data sought will be used for were also highlighted. These approaches are used to incentivise respondents in survey research (Bryman and Bell 2007; Saunders et al., 2016).

3.12 Response rate

Given the low response rate associated with e-mail surveys, which stands at between 24% and 76%, the researcher made extra efforts like those highlighted in Bryman and Bell (2007) to overcome this by sending out reminder emails to respondents and making follow-up phone calls to encourage completion as practised by other known authors (McMurray et al., 2014; Yusuf et al., 2013). This is particularly significant, to get the respondents who are faced with their challenging daily official duties to complete the questionnaire. This is also necessary, considering respondents' attitudes towards research in developing countries (Musa et al., 2013). The approaches used in this research to improve the questionnaire response rate can ultimately be considered effective given the response rate reported in this research.

Of the 118 O&G upstream firms sampled in this research, 96 firms were contacted due to available contact information, such as e-mail, and questionnaires forwarded to their procurement departments, requesting that they should be completed by only a procurement professional. Although we cannot rule out the completion of the questionnaire by non-procurement professionals, efforts have been made on our part by clearly indicating that procurement professionals only complete the questionnaires. From the 96 questionnaires sent out, 74 were completed and returned with 51 of these responses considered useful after scrutiny for completion and missing data, indicating a response rate

of 53%, which is considered high and acceptable for this research (Sue and Ritter, 2007). Lower response rates have been observed in previous SP research (Delmonico et al., 2018; McMurray et al., 2014; Meehan and Bryde, 2011; Walker and Brammer, 2009). It is also important to note that due to the challenges of obtaining data by questionnaire, the small response rate is becoming more evident in the O&G sector and sustainability studies (Ahmad et al., 2016a; Roman, 2017; Ruparathna and Hewage, 2015; Yusuf et al., 2013).

3.13 Non-response bias

Assessing non-response bias has become paramount in business research especially those with quantitative fundamentals which aim to generalise their research findings to the entire population (Saunders et al., 2016). It is assumed that generalising a research finding to the entire population without the perceptions of non-respondents is not a true reflection of the entire population. Flynn et al. (1990) suggested some approaches for evaluating non-representative sample against respondents in the research sample, to determine if they are systematically different. For example, they noted that the sample can be differentiated using available information to identify respondents and non-respondents, after which non-respondents should be contacted to provide some information regarding the questionnaire. However, this may be challenging in questionnaire surveys which are mainly disseminated anonymously. They also suggested the use of archival data to ascertain if there is a significant difference among non-respondents and respondents.

While the assessment of a non-response bias is mainly associated with surveys with a response rate below 50% (Musa et al., 2013), the response rate of 53% obtained in this research cut across the different business sectors of the upstream O&G sector highlighted in the respondents' profile contained in the findings chapter. It is also important to note that the survey questionnaire was distributed via internet-mediated approach, which was done in a single wave. Considering the characteristics of the research population and the characteristics of respondents subsequent obtained, the researcher is confident that issue of non-response bias does not exist in the data, although this cannot be ruled out, because inherently only respondents familiar with SP practices are likely to respond (Walker and Brammer, 2009). However, to eliminate doubt, a wave analysis of early respondents and late

respondents – those who responded to the survey after reminders were sent, was conducted with an independent sample *t*-test as advocated in the literature (Field, 2013; Pallant, 2016; Saunders et al., 2016) and used in similar SP research (Meehan and Bryde, 2015; Roman, 2017). The results of the *t*-test analysis indicated a non-significant difference between the two groups of respondents, thereby eliminating issues of non-response bias in this research.

3.14 Data analysis techniques

The questionnaire is the main form of data collection used in this research project to obtain exclusive in-depth primary data from the upstream O&G sector. The questionnaire was designed based on the literature review of SP practices conducted in this research and input from industry experts. The PSR scales developed by Carter and Jennings (2004) and used by prominent authors of SP research was adopted. To cover the fundamental dimensions and practices for operationalising SP, the questionnaire used five-point Likert scale (strongly agree = 5, agree = 4, not sure = 3, disagree = 2 and strongly disagree = 1) as agreed in the literature, and three open-ended questions seeking in-depth qualitative data, to collect data for this research (Delmonico et al., 2018; Islam et a., 2017b; Walker and Brammer, 2009; Yusuf et al., 2013). At the end of the data collection phase, the data collected was download from the BOS website used to develop and distribute the questionnaire. The downloaded data was then saved in xlxs (Microsoft Excel) and sav (IBM SPSS) formats. However, due to complications within the SPSS file, the data cleaning and screening was done in the excel file. This involves omitting incomplete data entries, deleting duplicates from firms and responses from non-procurement professionals. The cleaning and screening process resulted in 51 usable samples as discussed previously.

The usable data obtained in this research were coded into and analysed on SPSS software (version 23) and SmartPLS using exploratory factor analysis, hierarchical multiple regression and confirmatory factor analysis. SPSS is a commonly used statistical analysis software package for the social sciences (Yusuf et al., 2013). Factor analysis is useful when research seeks to examine the relationships among variables (Collis and Hussey, 2014). Consulting the research objectives, the researcher intends to examine the underlying relationships among

the variables identified in this research, to ascertain their effects on the issues raised, i.e. on the TBL. This is expected to provide insights on those practices that can independently lead to the achievement of the TBL. Meaning firms can channel their limited resources to implementing those practices. Although the use of factor analysis as a statistical technique within SPSS could be problematic and involve high levels of skills (Saunders et al., 2007; Yong and Pearce, 2013), it is the most appropriate and suitable tool for analysing quantitative data, especially when exploring such data – a key objective of this research ***(OBJ2)*** (Field, 2013; McMurray et al., 2014). This technique has also been utilised in similar research studies (Ahmad et al., 2016b; Delmonico et al., 2018; Meehan and Bryde, 2015; Islam et al., 2017b).

In addition, this research seeks to examine whether sustainability initiatives, clear SP strategy and corporate characteristics influence firms to implement SP practices. To achieve this purpose of the research that is encapsulated in ***OBJ3***, ***OBJ4*** and ***OBJ5***, a multiple regression analysis was conducted. However, the multiple regression was done after the *Factors* in this research had been established. Discussion on the use of multiple regression in this research is provided in section 3.14.2. One more objective ***(OBJ6)*** of this research is to ascertain whether the adoption of SP practices has any effect on firms' performances and overall firms' corporate sustainability. In other words, it will test for significant associations among the variables, and firms' overall performance with a view of generalising its findings to the research population. A confirmatory factor analysis with the aid of SmartPLS was conducted to achieve ***OBJ6*** in establishing the impact of SP practices on firms' performances.

3.14.1 Factor analysis

Factor analysis was originally developed by Charles Spearman and is widely used in psychology and social science research, particularly in research where questionnaires are used, like in this current study, to reduce complex sets of data into a manageable size (Field, 2013; Kline, 1994). It is generally used for summarising data in such a way that data association and patterns could easily be explained and understood (Yong and Pearce, 2013). Factor analysis can be used to explain the correlation and variation between *variables* and *latent variables*. Understanding this correlation and these variations are essential

considering that variables and latent variables are common in every given set of data (Tucker and MacCallum, 1997). Factor analysis is also useful where research seeks clarification on how different factors influence variables, as well as to understand interrelationships among variables (Gorsuch, 2015; Yong and Pearce, 2013).

Latent variables are very significant due to their impact on surface attributes (Tucker and MacCallum, 1997). Latent variables are described as unobservable constructs, which cannot be specifically measured but are used to represent variables (Field, 2013), while variables are observable constructs to be measured in research projects (Yong and Pearce, 2013). Variables and latent variables are also referred to as surface attributes and internal attributes or factors respectively (Tucker and MacCallum, 1997). These terms are thus used interchangeably in this research. Factor analysis is designed to explain and interpret the relationships or variations between these two types of variables. For instance, factor analysis can be used to identify variables and latent variables in a set of data and the relationship between the latent variables and the variables.

To use factor analysis, researchers are advised to consider carefully the sample size and the variables to be tested (Field, 2013; Tucker and MacCallum, 1997). For example, with regards to variables, care must be taken to ensure that the attributes included in the research questionnaire measure the dimensions of SP practices identified in this research. The sample size, on the other hand, is very crucial in factor analysis. In stressing the need for appropriate sample size, Kline (1994, p. 73) stated thus: *"sample must not only be representative but must be of sufficient size to produce reliable factors"*. Similarly, sample size plays a major role in the reliability test in factor analysis (Field, 2013). Although most factor analysis articles in the literature stress the need to use appropriate and large sample sizes, the recommended sample size varies across the literature (Field, 2013; Guilford, 1956; Kline, 1994; Yong and Pearce, 2013), indicating a lack of consensus in this regard.

In examining the appropriate sample size, communality level has also been implied as a key factor (MacCallum et al., 1999). In addition, de Winter et al. (2009) noted that with a sample size of 50 or less, reliable results can be realised if high communality, a high number of

variables and fewer factors are achieved. This variation in sampling adequacy is also observed in the plethora of research utilising factor analysis. This can be considered as one of the limitations of this research, considering that the sample size is only 51. However, the Kaiser-Meyer-Olkin (KMO) sampling adequacy measure conducted in this research (0.865) indicates that the sample size is sufficient (Field, 2013). In addition, the result of Bartlett's test of sphericity, which also tests for sample adequacy, is 0.000 ($p < 0.001$). Based on the results of the statistical measurement of sampling adequacy obtained, it is assumed the sample size requirement posed by factor analysis is met. Similar sample size has been used in SP research (Delmonico et al., 2018).

In addition to the above requirements, in factor analysis, it is significant for researchers to make known the chosen method of either analysis, which can be exploratory factor analysis or confirmatory factor analysis (Kline, 1994; Tucker and MacCallum, 1997). According to Field (2013, p. 674), the choice of factor analysis used is determined by *(1) the nature of the research, i.e. exploration of data or testing of specific hypotheses and (2) whether the research findings would be generalised to a population*. Although both exploratory and confirmatory factor analyses have drawbacks, they are both significant methods essential for the advancement of theory and research (Cumming, 2014; Kline, 1994; Reio and Shuck, 2015). In this regard, care must be taken when adopting any of the methods. Reio and Shuck (2015) noted several issues, i.e. sample size, the number of factors to extract, type of rotation, and interpretation and name of factors to be considered, that would help researchers in their decision-making process.

3.14.1.1 Confirmatory factor analysis

The confirmatory factor analysis (CFA) is associated with the testing of hypotheses (Reio and Shuck, 2015). In research where specific hypotheses are proposed to be tested, such research must consider using confirmatory analysis. To confirm hypotheses, the confirmatory analysis makes use of path diagrams to represent the relationships among the surface attributes and internal attributes (Yong and Pearce, 2013). This research aims to explore the underlying relationships among the research variables as well as validating the theories of SP practices. However, the hypotheses in this research would be tested using

multiple regression. Notwithstanding CFA is needed in this research to confirm or disconfirm the effect of SP practices on firms' performances (Reio and Shuck, 2015; Tucker and MacCallum, 1997), which is ***OBJ6*** of this research. The performance measures used in this research are pre-existing, valid and the confirmed measures used in the literature (Yusuf et al., 2013). CFA has been utilised in similar studies (Islam et al., 2017b; Zhu and Sarkis, 2004). The CFA analysis conducted in this research utilised structural equation modelling (SEM) technique performed with the aid of SmartPLS. In line with the SmartPLS literature, the results of the measurement model for reliability and validity indicate satisfactory values, i.e. factor loadings above 0.40, composite reliability above 0.70, average variance extracted 0.50 and above, and Fornell-Larcker criterion above 0.70. These values, therefore, confirmed the measurement model to be reliable and valid and consistent with the literature (Hulland, 1999; Islam et al., 2017b; Wong, 2013).

3.14.1.2 Exploratory factor analysis

Contrary to the CFA, exploratory factor analysis (EFA) is conducted to determined underlying relationships between variables (Tucker and MacCallum, 1997). As the word *'exploratory'* already suggests, this method is employed to discover new or hidden surface attributes within the dataset in a research project. Apart from examining the relationships between surface attributes, an EFA is also useful for revealing internal attributes influencing such surface attributes (Yong and Pearce, 2013). The EFA is intended to achieve ***OBJ2*** to determine the underlying relationships among SP practices within the Nigerian O&G sector. The EFA is commonly used in new research areas such as this current research and has accordingly been adopted in similar studies (Delmonico et al., 2018; Hasselbalch et al., 2014; Meehan and Bryde, 2015; Walker and Brammer, 2012). EFA aims to explore the interrelationships between observable variables with the intent of generating theories in some cases (Reio and Shuck, 2015). Although this research is intended to validate the existing theories and models, it is significant to explore the interrelationships between the dimensions of SP practices within the context under study. This will allow the researcher to identify common patterns in the variables observed. The scale reliability of the variables used in the EFA analysis was tested using Cronbach's alpha *(a)*. Cronbach's alpha *(a)* is the most common measure used to test the possibility that the same scores obtained using a

specific scale can be obtained if administered at a different time (Field, 2013; Hair et al., 1998). The Cronbach's alpha *(a)* which have recommended values of 0.7 or higher (Doloi et al, 2012; Field, 2013) has been utilised in similar SP studies (Delmonico et al., 2018; Islam et al., 2017b; Walker and Brammer, 2012). The Cronbach's alpha *(a)* test of the EFA analysis demonstrated good reliability for the three factors extracted in the analysis (0.894, 0.862 and 0.747), indicating the scale is reliable.

3.14.1.3 Factor extraction

Factor analysis is used in research where a huge amount of data is expected, to reduce such data to a manageable size without losing their value (DeVellis, 2016). As expected in such research, which is mostly in form of questionnaires, there would be a lot of factors drawn from the identified variables. In most cases, not all the factors in research are retained, which, therefore, give rise to factor extraction – a process in which the researcher is required to decide on which factors to take and those to exclude for analysis (DeVellis, 2016). This process can be done using either the *component model* or *common factor model* (Reio and Shuck, 2015). Like factor analysis, the component model focuses on reducing many surface attributes to smaller management surface attributes, whereas the common factor model is focused on understanding the internal attributes and their relationships with identified surface attributes. In both cases, the criteria for deciding which factors to keep or remove are influenced by the factors with larger eigenvalues (Field, 2013). Having said this, considering the exploratory nature of this current research, the common factor model, which has received wide acceptance when compared to the component model, is best for extracting factors in this research and is therefore adopted (Osborne and Costello, 2009).

3.14.1.4 Factor rotation

Moving forward from factor extraction is factor rotation. Since factor analysis is adopted to explain and understand variations and correlations among observed variables, it is essential that such variations and correlations are interpreted at the end. Factor rotation is aimed at improving such interpretation of research findings (DeVellis, 2016). Kline (1994) stressed that rotation must be done before factors are interpreted regardless of the factor analysis method employed in a research project. In general, there are two types of factor rotation,

i.e. orthogonal rotation and oblique rotation (Field, 2013; Reio and Shuck, 2015). The orthogonal rotation, which assumes factors are not correlated, has three methods, *varimax, quartimax* and *equamax*, is the most popular and commonly used rotation (Reio and Shuck, 2015), while the oblique rotation with two methods, *direct oblimin* and *promax*, is considered difficult as it allows correlation among factors, thereby hindering its usage (Field, 2013).

3.14.2 Multiple Regression

In addition to the factor analysis, multiple regression was done to test the research hypotheses formulated in this research. The multiple regression considers ***OBJ3***, ***OBJ4*** and ***OBJ5*** of the research upon which the hypotheses were formulated. Considering limited and mixed evidence on the issues highlighted in ***OBJ3***, ***OBJ4*** and ***OBJ5*** on the part of the literature, it has become significant in this present research. This is intended to provide clarity to academics, policymakers and practitioners in the management and sustainability field concerning the influence the variables examined therein have on SP implementation. According to Spicer (2005, p. 91) multiple regression is referred to as *"a data analysis technique that enables the analyst to examine patterns of relationships between multiple independent variables and a single dependent variable"*. This form of multivariate data analysis is found to be very prominent due to its flexibility to accommodate different types of independent variables (Spicer, 2005). For example, although multiple regression mainly uses interval scale data, other forms of data can also be used. It is also capable of determining the combined relationship among independent variables and the dependent variable (standard multiple regression) or the relationship of individual independent variables on the dependent variable (hierarchical multiple regression) (Pallant, 2016; Tabachnick and Fidell, 2007).

Hierarchical multiple regression was used in this research due to the independent variables considered in this research. Hierarchical multiple regression is suitable for controlling the impact independent variables has on the regression model. Essentially, with hierarchical multiple regression, one could identify the significance of individual independent variables on the dependent variables when added or remove from the model. Since this research

seeks to specifically ascertain the influences of sustainability initiatives, clear SP strategy and firm characteristics on SP implementation distinctly as presented in the hypotheses section of chapter two, the hierarchical multiple regression is considered the most appropriate technique. However, like any many other analysis techniques, important issues must be addressed to satisfy the usage of the regression analysis. For example, sample size, multicollinearity and singularity, outliers and normality are some of the screening researchers should consider before proceeding with their analysis (Pallant, 2016; Tabachnick and Fidell, 2007).

Discussions on sample size had earlier been presented in this research. There are different rules-of-thumb about sample size when conducting multiple regression analysis (Pallant, 2016; Green, 1991). The sample size of 51 in this research, is considered acceptable for multiple regression analysis. Whilst the common cases-to-independent variables ($N \geq 50 + 8m$, where m is the numbers of independent variables) method is not achieved because this research utilised only 6 independent variables, the statistical analysis proved to have significant results and therefore reliable. Spicer (2005, p. 35) also suggested that a sample size of 50 is acceptable when he stated thus: *"For now, a very rough guide would be that an absolute minimum of 50 cases is needed for any single multivariate analysis…"*. This author also noted that the sample size is not the only method used to assess the reliability of research findings. The competence of respondents is also said to have a major effect on the reliability of multivariate analysis. In this research, only procurement professionals assume to have knowledge of the procurement function of their respective firms had been selected. Although the emphasis was made to those with managerial responsibilities, this research also considered the responses of procurement professionals at lower levels. A decision made not only to improve the response rate but also to obtain reliable information, needed to realise the research purpose.

With regards to issues of multicollinearity and outliers, a test was conducted using correlation analysis to ensure there are no highly correlated independent variables. The correlation matrix showed low multicollinearity among the variables as there is no correlation above 0.9 (Pallant, 2016). In addition, the results of the regression analysis,

confirmed variance inflation factors (VIF) values under 3, which is well below the recommended level of 10 (Esfahbodi et al., 2016; Hair et al., 1998; Walker and Brammer, 2012). Further explanation regarding the reliability and validity of the multiple regression analysis conducted in this research are presented alongside the discussions of the research findings. It is also important to note that the approach used in this research is consistent with relevant best practices (Hair et al., 1998; Lenny Koh et al., 2007; Walker and Brammer, 2012).

3.15 Research reliability and validity

The importance of addressing issues of data quality in social science research for demonstrating the credibility and truthfulness of research findings is documented within the methodology literature (Bryman and Bell, 2011; Field, 2013; Saunders et al., 2012). The quality assurance of research is mainly determined by the outcome of its reliability and validity test (Field, 2013; Saunders et al., 2012). Reliability is referred to by Bryman and Bell (2011, p. 158) as *"the consistency of a measure of a concept"*. They also defined validity as a concept used to determine whether an indicator that is set to measure a concept actually measures such a concept. In other words, validity questions the integrity of research findings (Field, 2013).

The validity test conducted in this research indicates that the instrument used actually measures SP practices within the Nigerian O&G sector. For example, to ensure content validity the questionnaires used were not only piloted but piloted amongst individuals with extensive knowledge of SP concept with both practical and research background. Furthermore, the issues addressed in this research were derived mainly from the extant SP literature and as such have gone through routine scrutiny. However, additional measures taken to boost the validity of this research include: questionnaire content assessed side by side with the objectives of this research to ascertain whether they can be achieved; respondents' responses were carefully vetted to determine their fullness and usefulness; responses found not to meet criteria set were omitted and unused. All of these approaches proved positive. Correspondingly, the results from the statistical analysis conducted, for example, the exploratory factor analysis, hierarchical multiple regression and confirmatory

factor analysis also confirmed the internal validity of the research findings as revealed in the findings chapter.

Table 3.6: Research quality design and tactics

Tests	Subtests	Tactics used	Point of assessment
Validity	***Content validity***	▪ Reliance on established SP scales from the literature ▪ Pilot study ▪ A thorough examination of the questionnaire against the research aims and objectives ▪ Vetting of responses and omission of incomplete responses	▪ Literature review ▪ Questionnaire design and development ▪ Data preparation phase
	Internal validity:	Assessed scores for: ▪ *Variance inflation factor (VIF)* ▪ *Model fit index (R^2 and R^2 adjust)* ▪ *Convergent validity (Average variance extracted)* ▪ *Discriminant validity (Fornell-Larcker criterion)*	▪ Multiple regression analysis ▪ Exploratory factor analysis ▪ Confirmatory factor analysis
Reliability	***Cronbach (a)***	Assessed scores for: ▪ *Extracted factors*	▪ Exploratory factor analysis
	Internal consistency reliability	Assessed scores for: ▪ *Composite reliability*	▪ Confirmatory factor analysis

In addition to the research validity test done to ensure the research quality, reliability test was also conducted. This is in line with Field's (2013) opinion, who noted that validity alone is not enough to establish research quality. Reliability as earlier explained, test whether a construct can consistently lead to the same result if tested at a different time. The SP constructs (environmental; product responsibility; health and safety; human rights, labour conditions and decent work; diversity; community development; economic development; philanthropy) utilised in this research have been tested in the past by prominent academics (McMurray et al., 2014; Walker and Brammer, 2009), and are therefore assumed reliable for

this present research. However, to further demonstrate reliability of the construct (e.g. questionnaire) used in this research, the practical steps noted earlier were upheld, such as the use of pilot study, which gave the researcher the opportunity to further improve the Likert scale questionnaire in such a way that the aims and objectives can be achieved (Yusuf et al., 2013). This research also relied on statistical method, using Cronbach *(a)* to determine the reliability of the scales used in this research. The *a* results in this research are greater than 0.7 as discussed in Section 3.14 of this chapter and presented in the findings chapter which therefore indicates good reliability of the construct used. The research quality design and tactics are summarised in Table 3.6.

In addition to the discussions above, it is argued further that to maintain reproducibility and replicability, the researcher held strong research ethics, by explaining in detail, the steps taken in this research to arrive on the findings. The research sampling frame and data collection techniques were discussed in detail. Although the research sample size is relatively small, it was adequate and in line with studies conducted within the sustainability field. Statistical tests were also carried out before the analysis were done, all of which came back positive as reported in this thesis. For instance, in line with the literature, the KMO and Bartlett's test was used was resulted in high values of 0.865 and 480.043 respectively (Delmonico et al., 2018; Field, 2013; Hutcheson and Sofroniou, 1999). The predictive power of the multiple regression models was also reported and discussed. This research utilised a highly structured approach, which further strengthens the research validity and reliability. In line with the literature (Doloi et al., 2012; Field, 2013; McMurray et al., 2014; Pallant, 2010; Walker and Brammer, 2012; Yusuf et al., 2013), the adopted methodologies and data analysis techniques used in this study are deemed suitable and appropriate, considering the aims and objectives outlined at the beginning of this chapter.

3.16 Ethical Issue

The importance of adhering to ethical guidelines when conducting research cannot be overemphasised. Information about compliance with ethical standards, such as the provision of ethical approval as well as information about the approving body is very essential in the academic field (Harriss and Atkinson, 2015). As contained in the University of Salford policy,

especially as it relates to PhD fieldwork, it is mandatory for students to complete an ethical process. This process involves the student identifying potential respondents/participants of the research, whether the research will use interviews or questionnaires, whether the research will involve human or animal tissues, whether there are any risks of harm to participants and several other issues.

In this research, an ethical approval form was completed, signed and sent to the research supervisor, who in turn completed relevant sections applicable to the supervisory team before sending the form to the university's research, innovation and academic engagement ethical approval panel for review and approval. It is imperative to note that information regarding the research including its aims, objectives, research questions, methodological approaches and data analysis techniques used in this research were all included in the ethical form sent to the University's research, innovation and academic engagement ethical approval panel. Upon receipt of approval from the University's ethical approval panel dated 16 May 2016, the researcher also applied for access into the Nigerian O&G sector to the Department of Petroleum Resources (DPR) Nigeria responsible for regulating the sector. Access into the Nigerian O&G sector was granted to the researcher by DPR on the 26th of July 2016.

The collection of data from participants was done in accordance with the strict guidance of the University as well as those of the UK Research and Innovation formerly Research Councils UK. Issues around informed consent, voluntary partaking, confidentiality, and anonymity were fully considered. The researcher provided relevant information to all the potential respondents about the research purpose and intended benefits. In specific, the invitation to participate letter addressed issues of confidentiality, anonymity and risks to participants. An informed consent form was also attached to the survey sent out to participants, indicating that by completing the questionnaire consent is confirmed.

3.17 Summary

It is clear from the extant literature that the SP concept is somewhat known within the O&G sector, although its adoption has remained quite unconvincing (Rice, 2009), instigating this

present research. It is also clear from the extant literature that there is a consensus on the dimensions of SP practices that have been utilised in developed nations and in both the public and private sectors. This leaves us with no doubt that these dimensions are valid. This position helped in shaping this methodology chapter. This chapter has examined the different types of research philosophies, philosophical assumptions, research approaches, methods, strategies and types of data collection techniques, and has explicitly discussed its chosen method as shown in Figure 3.1, providing strong justifications to this effect. This process is done with the aid of relevant business management and sustainability literature.

With an overall aim *"to determine the underlying dimensions of SP practices and empirically examine the relationships among SP practices, performances, procurement sustainability strategy and initiatives within the Nigerian O&G sector",* suitable objectives were formulated. The objectives of this research determined the methodological approaches used in this research. To realise the research objectives, it was apparent that the use of EFA, hierarchical multiple regression and CFA were the most appropriate data analysis techniques. For example, EFA can study underlying relationships among large independent variables, whilst reducing such independent variables to the management scale, as confirmed in the findings chapter of this research. The suitability of the hierarchical multiple regression is also certain, bearing in mind the need to weigh the impact of individual independent variables on the dependent variables, whilst using firms' characteristics as control variables. Lastly, research of this nature cannot be complete without any insights on how much impact the implementation of SP practices has on firms engage in these practices. Since there are well-defined performance measures in the sustainability literature, the choice of conducting a CFA was easy.

Ultimately, this chapter has provided considerable discussion, justifications and evidence to support the methodological and analytical approaches used in this research. Given the research problem and the purpose thereof, these approaches are deemed the most appropriate and suitable. To conclude, a substantial amount of work relevant to the issues involving methodological and analytical choices have been covered in detail to meet the requirements of PhD research.

CHAPTER FOUR: ANALYSIS AND FINDINGS

4.1 Introduction

This research selected respondents who are procurement professionals (i.e. procurement executives, procurement managers, procurement officers, procurement supervisors, purchasing managers, buyers, procurement specialists) from the upstream part of the O&G sector in Nigeria. All the representatives duly communicated with the consent of the Department of Petroleum Resources, a government parastatal body that is charged with such duties. The selected respondents proved to have reasonable or substantial work experience in the procurement domain, especially within the Nigerian O&G sector. It is important to note that before the questionnaire was distributed to potential respondents, a formal invitation to participate in this research, in letter format, had earlier been sent, where the aim and objectives of the research were clearly stated, as well as the general purpose of the data to be collected.

As noted in the methodology chapter, the questionnaire was administered to 96 firms randomly from the 118 sampled firms, out of which 74 responses were received. From the 74 responses received, 51 were considered as useful because the rest were either completed by a non-procurement professional (as shown by the respondent's position) or not fully completed and, therefore, excluded. This resulted in a response rate of 53.1%, which, though assumed low given the relatively small sample size, is acceptable considering the quality of the data collected (which includes both qualitative and quantitative), the sources of the data, the challenges associated with accessibility in the O&G industry and the low response rate associated with surveys (Doloi et al., 2012). From a statistical point of view, the data collected are sufficient, considering a large number of variables and attributes contained in the dataset. As noted in the methodology chapter, the questionnaire was designed in line with the confirmed dimensions developed and used by Carter and Jennings (2004) – *environmental, health and safety, human rights, diversity, philanthropy;* Walker and Brammer (2009) - *procuring from small and local suppliers;* and Mansi (2015) - *product responsibility, community development; sustainable economic development.* These

dimensions were also used in other SP studies, which further endorse their reliability (Brammer and Walker, 2011; McMurray et al., 2014).

4.2 Profiles of questionnaire respondents

To define the respondents' profiles, the researcher adopted the method used by Yusuf et al. (2013) and made a new addition – namely, the respondent's position. This is essential to exhibit potential respondents' procurement backgrounds. In this regard, four variables were used, i.e. respondents' positions, approximate numbers of employees, firms' approximate yearly turnovers, and their business sectors, as shown in Table 4.1.

Table 4.1: Profile of respondents

Variables	Percentage
Respondent's position	
Procurement officer	35.3
Procurement manager	27.4
Procurement specialist	7.8
Procurement executive	9.8
Head of procurement/logistics	9.8
Senior buyers	3.9
Contract analyst	2.0
Purchasing manager	3.9
Total	**100.0**
Approximate number of employees	
1 - 50	14.3
51 - 200	22.4
201 - 500	22.4
501 and above	40.9
Total	**100.0**
Firm's approximate yearly turnover	
<$5m	5.9
$5m - $20m	11.8
$21m - $50m	11.8
$51m - $100m	13.7
>$100m	56.9
Total	**100.0**
Business sector	
O&G operator	24.5
O&G servicing firm	14.8
O&G logistics & transport	15.6
Exploration and production	27.0
O&G consultancy	6.6
Marine engineering & construction	11.5
Total	**100.0**

The profile of the respondents as highlighted in Table 4.1 shows that procurement officers comprise the largest set of respondents with 35%, followed by the procurement managers

with 27%, and procurement specialists with 8%. Both procurement executives and heads of procurement or logistics account for 10% each, senior buyers and purchasing managers 4% respectively, while contract analysts make up 2% of the respondents. The above scores iterate the research design, which utilises only procurement professionals. A distinct and interesting job title observed in the response is the contract analyst with 2%. This is an interesting entry because the procurement function includes contracting (Ward, 2008), which makes the responses valid and significant since it is the responsibility of the contract analyst to ensure that ethics and codes of conducts, which should incorporate sustainability and sustainable procurement measures particularly are included and observed in contracts. Furthermore, companies that have a yearly turnover above $50m employ the majority of the respondents (70%), a fact indicating that the bulk of the sample firms are large and multi-national in size (Yusuf et al., 2013).

Furthermore, in this study, the respondents are well distributed among the business sectors of the upstream O&G sector except for consultancy, which constitutes only 7%. For example, operators account for 25%, servicing firms for 15%, logistics & transport for 16%, exploration and production for 27%, and marine engineering and construction for 12%. However, it is observed the majority of the respondents are from the exploration and production sector accounting for 27% of the population. This clearly highlights the fact that the upstream sector is mainly focused on the exploration and production of petroleum products.

4.3 Analysis of qualitative data and observations

Before dwelling on the main statistical analysis of this study, the researcher would first make a note of some key observations in the research findings and analyse the qualitative data collected with the aid of a questionnaire. A unique observation from the data analysis relates to the awareness levels of SP practices, which stood at 90%, against the 10% who claimed not having knowledge of SP practices. It is termed unique because: (i) it is coming from a developing country context; (ii) such practices do not reflect on the Nigerian society. On reflection, this is expected considering that the sector is dominated by firms with a global presence in developed countries such as the UK, France, Germany, USA and Norway where sustainability practices are well adopted and implemented. Notwithstanding, this finding

demonstrates a very high level of SP awareness within the Nigerian O&G sector. Further, to appreciate their understanding of SP, the questionnaires sought a definition of SP and, as expected, there were diverse opinions, which mostly address the TBL of SP. Below are some definitions of SP as defined by the respondents:

> *"It is a process whereby organizations meet their demand and need for goods and services in a way that it achieves value for money on a whole life-cycle basis thereby generating benefits not only to the organization but also to the economy, while also reducing any negative impacts on our environment"*

This definition corroborates the definition of SP provided in Meehan and Bryde (2011) and DEFRA (2006). It is also in line with the definition of Naoum and Egbu (2015), where SP is referred to as a process whereby organisations meet their procurement needs using a whole life costing approach to generate long-term benefits for the organisation and society. Other definitions as provided by the respondents are:

> *"Sourcing and obtaining goods and services that are not only environmentally friendly but also satisfy economic, legal, moral and philanthropic requirements"*

> *"It is the procurement that is consistent with sustainability goals, such as considering the environmental, economic and social effects of procurement decisions"*

The above definitions no doubt incorporate the TBL and therefore suggest that it is a well-understood concept within the sector. However, knowledge of SP does not automatically result in its adoption, as shown in the findings where the percentage of respondents who have adopted SP practices dropped to 84% from the 90% who claimed to know SP with 16% accounting for those who have not adopted SP. This finding implies that there are additional factors other than awareness impeding SP adoption, as the SP literature suggests (Brammer and Walker, 2011; Mansi, 2015; McMurray et al., 2014; Walker and Brammer, 2009; Zhu et al., 2005). There is a promising side to this finding since 90% of those who have not adopted SP are considering its adoption, while 10% were not sure about adopting SP. It is also

observed from the results that the adoption of SP practices within the last decade was 93%, while just 7% claimed to have adopted SP more than 20 years ago. From the data collected, none of the respondents indicated they adopted SP practices between 10 and 20 years ago. The low adoption levels of SP in the former decade in comparison to the last decade demonstrates the recent surge in sustainability issues over the past decade, which is as a result of increased awareness and the rising momentum placed on environmental and climate change issues (Hasselbalch et al., 2015).

4.3.1 Drivers of sustainable procurement practices

To analyse the SP drivers, the researcher ranked the most commonly mentioned drivers in ascending order with '1' ranked as the highest and being the most cited driver. This was done according to the number of times it appeared as a driver of SP implementation according to respondents' statements. Common themes had first been identified before suitable categories were generated for the drivers and barriers (Brammer and Walker, 2011). The drivers of SP within the Nigerian O&G sector as revealed in the research findings are highlighted in Table 4.2.

Table 4.2: Drivers of sustainable procurement

SP Drivers	No of Resp.	Rank
Government regulations & policies	26	1
Firm policies and strategies	14	2
Community & environmental development	10	3
Local content act**	9	4
Improve firm performance	7	5
Competence (i.e. resources, expertise)	6	6
Improve firm reputation	5	7
Top management support	4	8
Awareness of SP practices	4	8
Collaboration (i.e. with contractors)	3	9
Gain a competitive advantage	2	10
Improve health and safety	2	10
The existence of CSR practice	1	11
Stakeholder pressure	1	11

**new driver

4.3.2 Barriers to sustainable procurement practices

The approach used in analysing the drivers is also adopted to analyse the barriers to SP as highlighted in Table 4.3. It is interesting to note that in contrast to the drivers to SP where a new driver was found, no new barrier was revealed. The barriers shown in Table 4.3 are amongst the many identified barriers to SP as observed in the literature (McMurray et al., 2014; Mena et al., 2014; Tay et al., 2015; Walker et al., 2008). A closer look at this finding also brings to the forefront that most of the barriers highlighted in Table 4.3 are internal to the firms, which corroborates the results of Walker et al. (2008) where more internal barriers were identified compared to external barriers. It is, therefore, argued that an honest commitment from firms can reduce and eliminate some of the barriers highlighted herein, thereby leading to SP implementation (Erdmenger, 2003; Michelsen and de Boer, 2009).

Table 4.3: Barriers to sustainable procurement

SP Barriers	No of Resp.	Rank
Insufficient regulations and policies	18	1
Lack of awareness	12	2
Cost of implementation	12	2
Lack of support from top management	10	3
Lack of resources (i.e. expertise, training)	8	4
Insufficient guidelines on implementation	5	5
Corruption	5	5
Lack of commitment	3	6
Conflicting organisational priorities	3	6
Lack of an established firm strategy	3	6
Lack of good infrastructure (i.e. roads)	2	7
Lack of cooperation (i.e. from employees)	2	7
Lack of competent local suppliers	1	8
Limited benefits	1	8

4.4 Analysis of quantitative data

The literature review conducted in this research suggests the adoption of SP practices vary from firm to firm. The preliminary questions contained in the questionnaire used in this research seeks some basic information regarding the dimensions of SP practices firms within

the O&G sector have implemented and how important these dimensions of SP practices are to their operations. This aspect of the data seeks to answer ***RQ1*** and ***RQ2*** of the thesis, after which the main statistical analysis, e.g. EFA, hierarchical multiple regression and CFA were conducted.

4.4.1 SP dimensions adopted within the sector

One of the questions this study sought to answer with the aid of the questionnaire relates to the SP dimensions adopted by the sample firms. The responses are highlighted in Figure 4.1 in percentage.

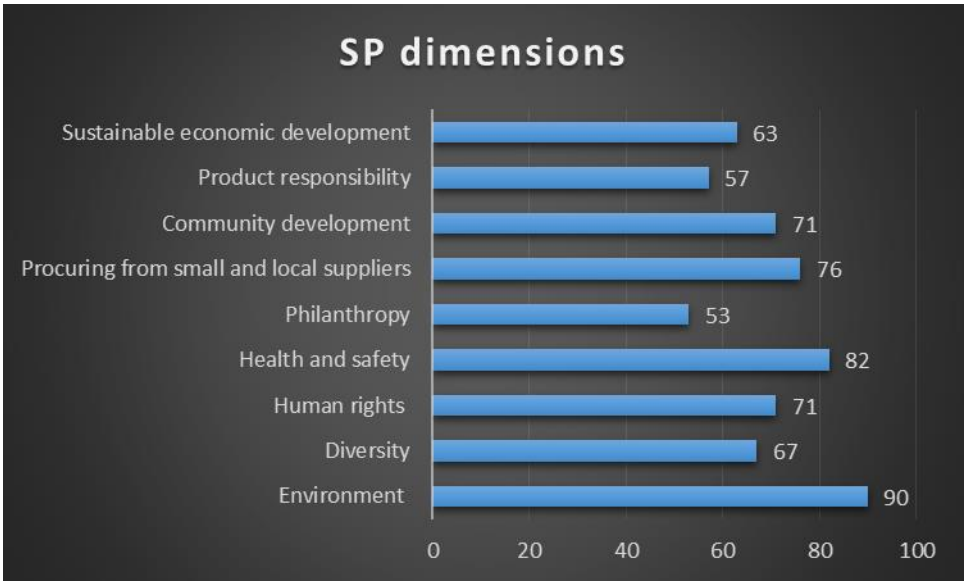

Figure 4.1: SP dimensions adopted by firms in the sector

The bar chart in Figure 4.1 shows that the *environmental* dimension (90%) is the highest adopted dimension of SP within the Nigerian O&G sector followed by *health and safety* dimension (82%). *Environmental* measures such as the purchase of products and services that are environment-friendly, the use of efficient and green energy, as well as having procedures for checking and preventing pollution fall within this dimension. This finding supports evidence from the literature, which noted that more attention is given to the environmental aspect of TBL (Islam et al., 2017b; Walker and Brammer, 2009; Walker et al., 2012; Young et al., 2016). The current environmental crisis within the Nigerian O&G sector that has attracted global attention can also be linked to the increased attention paid to

environmental issues. *Health and safety* measures take the form of ensuring firms' manufacturing and project locations are operated in a safe manner while ensuring the safe movement of products to and from facilities.

Furthermore, 76% *procure from small and local suppliers*, while 71% have adopted both *human rights* and *community development* dimensions. 67% of the respondents' firms have adopted *diversity* measures, whereas 63% have adopted *sustainable economic development* measures. 57% and 53% accounts for the adoption of *product responsibility* and *philanthropy* dimensions respectively. The finding regarding *procure from small and local suppliers* demonstrates the success of the local content act being implemented across the sector by the Nigerian government. To this end, these figures give very useful insights into the research question *(1) – "What are the nature and extent of SP dimensions within the Nigerian O&G sector?"*

4.4.2 Perceived importance of SP dimensions

To ascertain the importance of the above-adopted dimensions the respondents were asked to rate on a Likert scale (5 very important – 1 not important) the importance of SP dimensions to their firms. Table 4.4 shows the perceived importance of each dimension, which corroborates with the SP dimensions adopted, where *environmental* and *health and safety* measures dominated the level of SP adoption. Environmental, health and safety issues are particularly widespread within the O&G sector, and as such, needs serious consideration (Ambituuni et al., 2014; Midttun et al., 2007; Nwagbara, 2013; Oppong, 2014). The dimensions considered not important by a minority of the respondents are *diversity, philanthropy* and *procuring from small and local suppliers* with scores of 4.3%, 8.7% and 6.0%, respectively. A possible explanation for this result could be that these firms do not see these dimensions as having any competitive advantage or important to their operations. This finding also corroborates the literature, which suggests that sustainability practices are implemented on a priority basis (Brammer and Walker, 2011; McMurray et al., 2013). Interestingly, the finding regarding *"procuring from small and local suppliers"*, reflects the concept of the local content act, which is implemented to build local suppliers and contractors within the sector, who were very much disregarded (De Vita et al., 2016).

Consequently, this discussion, as well as the figures presented in Table 4.4 answer the research question (2) – "How important, *are SP dimensions to firms within the Nigerian O&G sector?"*

Table 4.4: Perceived importance of SP dimensions adopted (%)

SP dimensions	Very important	Important	Not sure	Somehow important	Not important
Environment	69.4	30.6	-	-	-
Diversity	34.0	49.0	10.6	2.1	4.3
Human rights	44.7	48.9	4.3	2.1	-
Health & safety	68.0	30.0	-	2.0	-
Philanthropy	13.0	47.8	23.9	6.5	8.7
Procuring from small and local suppliers	50.0	34.0	6.0	4.0	6.0
Community development	42.6	42.6	6.4	8.5	-
Product responsibility	34.0	44.7	17.0	4.3	-
Sustainable economic development	50.0	40.5	4.8	4.8	-

4.5 Factor analysis

As mentioned in the methodology chapter, exploratory factor analysis (EFA) is used to analyse the quantitative data in this research. In particular, EFA was conducted to answer ***RQ4*** which stems from ***OBJ2*** of this research. EFA is used for reducing and providing a clear representation of largely correlated variables by selecting a smaller amount of highly related variables (Doloi et al., 2012; Wiredu, 2016). Pearson correlation analysis was performed to create a correlation matrix (*R*-matrix) of 55 variables derived from the questionnaire developed for this research. Upon thorough perusal of the correlation matrix, 15 variables were selected for further analysis due to their correlation levels while 40 variables were excluded as they were considered excessively high, low or non-significant in the correlation matrix. This approach is vital to eliminate multicollinearity within the data set (Field, 2013).

4.5.1 The KMO and Bartlett's test for sample size

The *'number one'* criterion for using factor analysis is an adequate sample size (Field, 2013; Jung and Lee, 2011; Kline, 1994). Although the existing literature on factor analysis sample size is still unclear (Reio and Shuck, 2015), there are several tests that can be performed to

ascertain whether the sample size for this research was sufficient. In this research, the Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity (Field, 2013) were used. The value for KMO is calculated as the ratio of the squared correlation among variables to the squared partial correlation among variables. In the factor analysis literature, a minimum of 0.5 is recommended by Kaiser (1974) to realise distinct and reliable factors. This research KMO measure of 0.865 as highlighted in Table 4.5 is based on the 15 variables selected for further analysis and shows that the sample size is adequate ('meritorious' according to Hutcheson and Sofroniou, 1999) and, therefore, acceptable (Delmonico et al., 2018; Field, 2013).

Table 4.5: KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.865
Bartlett's Test of Sphericity	Approx. Chi-Square	480.043
	Degree of freedom	105
	Significance	0.000

However, to further scrutinise this test, the researcher carried out a visual check of the anti-image correlation matrices table (see Table 4.6 - the corresponding vertical values are numbered 1 – 15 on the horizontal axis) to check the sampling adequacy for each of the selected 15 variables (Field, 2013). These variables are represented in the diagonal of the anti-image correlation matrix. The researcher confirmed that this practical endeavour also came out positive in favour of the sample size used for this research because the variables were all above the minimum 0.5 recommended (Field, 2013). In addition, Bartlett's test of sphericity 480.043 is *significant* at 0.000, ($p < 0.001$), which also means that the sample size is good and appropriate for factor analysis because it is less than the 0.05 recommended (Pallant, 2010). These approaches were utilised by Delmonico et al. (2018) in a similar SP study, which had lower KMO values (0.665).

Table 4.6: Anti-image correlation matrices

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15
1. Checks & prevents pollution	**.859**[a]														
2. Ensures suppliers abide by all minimum standards & laws	0.059	**.875**[a]													
3. Project locations are operated in a safe manner	-0.190	-0.197	**.880**[a]												
4. Safe movement of products	-0.329	-0.258	-0.143	**.908**[a]											
5. Policy on disabilities	-0.040	0.250	-0.059	-0.019	**.856**[a]										
6. Policy to respect diversity of employees	0.110	-0.216	-0.110	-0.047	-0.280	**.841**[a]									
7. Purchase environmental-friendly products from MWBE	-0.024	-0.225	0.235	0.057	-0.076	-0.190	**.890**[a]								
8. Policy to provide education & training to develop communities	0.042	-0.045	0.055	-0.066	-0.406	0.073	0.055	**.903**[a]							
9. Policy to improve living conditions & the economy	-0.208	-0.077	0.033	-0.001	-0.161	0.182	-0.273	-0.082	**.821**[a]						
10. Engages in social activities to develop communities	0.003	0.243	0.071	-0.100	0.184	-0.044	0.084	-0.101	-0.058	**.902**[a]					
11. Sources from local suppliers to provide economic benefit to communities	0.245	0.153	-0.182	-0.228	0.174	-0.038	-0.003	-0.264	-0.190	-0.040	**.860**[a]				
12. Policy on ethical practices	0.134	-0.155	0.202	-0.152	-0.132	0.273	-0.007	-0.201	0.278	-0.254	-0.199	**.829**[a]			
13. Policy to enhance transparency	-0.213	-0.183	-0.015	0.083	0.051	-0.318	0.033	-0.076	-0.502	-0.106	0.129	-0.327	**.875**[a]		
14. Policy to ensure sus. eco. dev.	-0.346	-0.115	-0.205	0.184	-0.140	-0.207	-0.089	0.210	-0.003	-0.276	-0.089	-0.543	0.176	**.840**[a]	
15. Donate to communities	-0.036	-0.121	-0.166	0.077	-0.175	0.080	-0.280	-0.071	0.211	-0.376	-0.466	0.147	-0.125	0.156	**.852**[a]

a. Measures of Sampling Adequacy (MSA)

4.5.2 Descriptive statistics of variables

Descriptive statistics are the tests of assumptions of research variables (Pallant, 2010). The essence of descriptive statistics is to assess the distribution of scores given by research participants. In factor analysis, this can be achieved with the univariate descriptive of each variable to show their mean, standard deviation and number of responses as indicated in Table 4.7. The descriptive analysis also further highlights the current state of SP practices within the Nigerian O&G sector as proposed in the objective section.

Table 4.7: Descriptive statistics of variables

Dimensions of SP	Correlated variables selected	Mean	Standard deviation	N
Environmental	V1 Checks & prevents pollution	4.10	0.944	51
Product responsibility	V2 Ensures suppliers abide by all minimum standards & laws	4.02	0.787	51
Health & Safety	V3 Project locations are operated in a safe manner	4.49	0.758	51
	V4 Safe movement of products	4.35	0.688	51
Human rights	V5 Policy on disabilities	3.39	1.185	51
Diversity	V6 Policy to respect diversity of employees	3.78	0.702	51
	V7 Purchase environmental-friendly products from MWBE	3.29	1.171	51
Community development	V8 Policy to provide education & training to develop communities	3.82	0.817	51
	V9 Policy to improve living conditions & the economy	4.06	0.785	51
	V10 Engages in social activities to develop communities	3.78	1.045	51
	V11 Sources from local suppliers to provide economic benefit to communities	4.06	0.881	51
Economic	V12 Policy on ethical practices	3.96	0.871	51
development	V13 Policy to enhance transparency	3.82	1.014	51
	V14 Policy to ensure sus. eco. dev.	4.02	0.735	51
Philanthropy	V15 Donate to communities	3.67	1.013	51

As contained in Table 4.7, all the variables are represented by the 51 responses judged to be useful for this research, which rules out issues of missing cases, as there is none in this

instance. These variables somewhat reflect the several approaches used for implementing sustainability into the procurement function (Carter and Jennings, 2004; Mansi, 2015; McMurray, et al., 2014; Walker and Brammer, 2012). The mean score of the respondents from the Likert scale of 5 (strongly agree) to 1 (strongly disagree) for each of the variables is indicated in Table 4.7. These scores show a good level of SP adoption within the sector under study, with V3 *(Project locations are operated in a safe manner)*, V4 *(Safe movement of products)* and V1 *(Checks & prevents pollution)* having high mean scores of 4.49, 4.35 and 4.10, respectively. This finding is consistent with the findings of McMurray et al. (2014) and Walker and Brammer (2012). This finding is also consistent with the results of the cross tabulation of the perceived importance of adopted SP practices within the Nigerian O&G sector found in this research. On the other hand, V7 *(Purchase environmental-friendly products from MWBE)* and V5 *(Policy on disabilities)* had the lowest mean score of 3.29 and 3.39 respectively, demonstrating that these are the least implemented SP practices within the sector. In the study of Brammer and Walker (2011) and Walker and Brammer (2012), buying from minority and women-owned business enterprises was also observed to be among the least embedded SP practices.

Some high scores were recorded against the standard deviation when compared to the mean scores, i.e. V5 *(Policy on disabilities)* (1.185), V7 *(Purchase environmental-friendly products from MWBE)* (1.171), V10 *(Engages in social activities to develop communities)* (1.045), V13 *(Policy to enhance transparency)* (1.014), and V15 *(Donate to communities)* (1.013). These high scores indicate there is fluctuation in the responses collected for these variables. This should not be considered as a problem but rather a good discovering of the level of importance placed on the variables noted above, which further addresses ***RQ2*** – *"How important are SP dimensions to firms within the Nigerian O&G sector?"*. The descriptive analysis also shows that some of the respondents are not sure if their firms have policies on SP practices. This result is closely linked to the most prevalent barrier (insufficient regulations/policies) of SP practices as found in this research. This shows that firms need to address the issue of policy building needed to address innovative approaches such as SP.

4.5.3 Factor extraction

Pallant (2010) described factor extraction as the steps needed to determine the smallest number of factors that can be used best to represent the interrelationships between a given set of data. This author noted that there are several approaches available for extracting factors. Field (2013) also stated that in order to extract underlying factors, the eigenvalues of the *R*-matrix should be calculated as they determine the linear components within the data set. However, this analysis was done with the help of SPSS software using principal axis factoring and Kaiser's criterion of retaining factors with eigenvalues above *1* (Walker and Brammer, 2012). As a general procedure, the software identified 15 factors, accounting for the 15 variables selected for further analysis (Wiredu, 2016), from which three factors with eigenvalues greater than 1 were extracted as shown in Table 4.8.

Table 4.8: Factors extracted in this research

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.623	50.822	50.822	7.252	48.345	48.345	3.588	23.918	23.918
2	1.591	10.609	61.431	1.228	8.188	56.533	3.409	22.727	46.645
3	1.002	6.677	68.108	0.588	3.917	60.450	2.071	13.805	60.450
4	0.793	5.288	73.396						
5	0.739	4.924	78.319						
6	0.694	4.630	82.949						
7	0.525	3.502	86.451						
8	0.445	2.967	89.418						
9	0.388	2.589	92.007						
10	0.308	2.052	94.059						
11	0.243	1.617	95.676						
12	0.222	1.477	97.153						
13	0.198	1.322	98.476						
14	0.126	0.842	99.317						
15	0.102	0.683	100.000						

Extraction Method: Principal Axis Factoring.

The three factors with eigenvalues greater than 1 account for about 68% of the total variance in the initial eigenvalues and account for 60% of cumulative variance explained in

the extracted solution, which indicates about 8% difference. These values (68% and 60%) are well above the 40% explained total variance suggested by Reio and Shuck (2015). Rotation sums of the squared loadings try to make even the extracted data as represented in Table 4.8 where the *Extraction Sums of Squared Loadings – Total* has values of 7.252, 1.228 and 0.588 while *Rotation Sums of Squared Loading – Totals* has values of 3.588, 3.409 and 2.071 for the 1st, 2nd and 3rd factors respectively.

As well as the use of Kaiser's criterion for retaining factors, a *scree plot* test also confirmed the retention of three factors (see Figure 4.2). This practice of utilising multiple methods to verify factor retention is consistent with the literature (Hasselbalch et al., 2014; Reio and Shuck, 2015; Zhu and Sarkis, 2004), to ensure researchers retain the right number of factors.

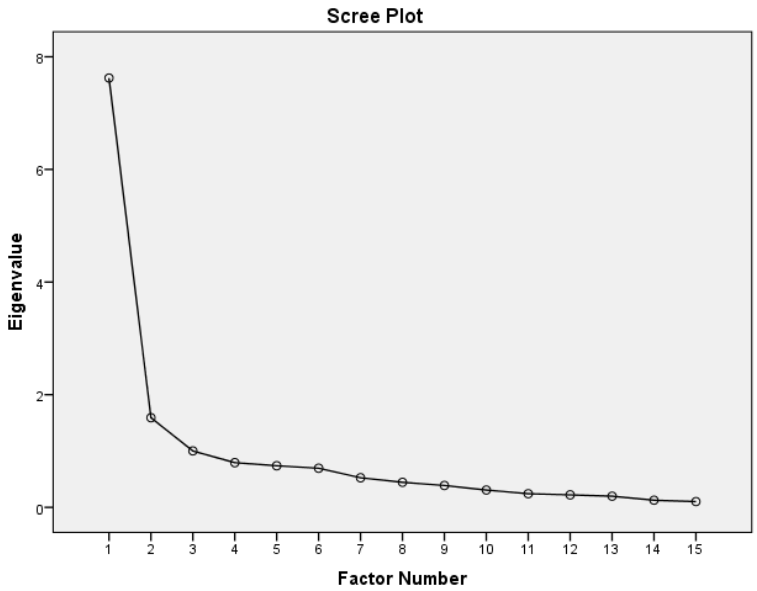

Figure 4.2: Scree plot showing factors extracted

The *scree plot* is a test developed by Catell (1966), which shows all the eigenvalues of the factors in a graph. Catell (1966) posited that only factors within the dominant slope of the curve should be retained, while values beyond the change point should be disregarded. The change point is where the curved graph changes into a straight line as shown in Figure 4.2. In this *scree plot,* the change point starts from factor 4, which gives room for the inclusion of only factors 1, 2 and 3. Having established the chosen underlying factors of this research, the

researcher will attempt to explain the common variances between the variables and the extracted factors.

4.5.4 Communalities within the variables

The need to understand the common variance within a data set has been well documented (Field, 2013; Jung and Lee, 2011). Communalities is simply referred to as the common variance between variables (Field, 2013). According to Jung and Lee (2011), communality level plays a significant part in decreasing or increasing the influence of sample size on the recovery of the population factors. For this purpose, a table of communalities is provided using SPSS to give details on how much of the variance can be explained for each variable.

Table 4.9: Communalities

	Initial	Extraction
Checks & prevents pollution	0.608	0.571
Ensures suppliers abide by all minimum standards & laws	0.611	0.558
Project locations are operated in a safe manner	0.497	0.364
Safe movement of products	0.568	0.496
Policy on disabilities	0.557	0.431
Policy to respect diversity of employees	0.527	0.437
Purchase environmental-friendly products from MWBE	0.522	0.481
Policy to provide education & training to develop communities	0.665	0.685
Policy to improve living conditions & the economy	0.641	0.595
Engages in social activities to develop communities	0.734	0.725
Sources from local suppliers to provide economic benefit to communities	0.743	0.756
Policy on ethical practices	0.816	0.756
Policy to enhance transparency	0.764	0.752
Policy to ensure sus. eco. dev.	0.780	0.791
Donate to communities	0.723	0.669

Extraction Method: Principal Axis Factoring.

In this research, Table 4.9 highlights the communalities explained for each variable before and after extraction. The values under the *Initial column* are the estimated common variance, while the values in the *Extraction column* show the actual common variance within each variable, which can be explained by the retained factors (Field, 2013). For instance, our first variable (checks and prevents pollution), has a common variance of 57.1% association with the extracted factors. This is true for the other 14 variables, which also denotes different common variances. A glance at these values reveals that they are all high values (>0.3) and therefore fit for analysis as suggested in the literature (Delmonico et al., 2018; Jung and Lee, 2011). This is because variables with values <0.3 indicate insignificant correlation with the other variables (Pallant, 2010).

4.5.5 Factor rotation

The benefit of factor rotation is to help interpret the extracted factors (Pallant, 2010). As SPSS does not label or interpret the factors specified in a restrictive form, by rotating them, they can be grouped in an orderly manner for easy interpretation. An orthogonal varimax rotation method was utilised to ease the interpretation (Doloi et al., 2012; Field, 2013). Orthogonal rotation assumes that factors are uncorrelated and therefore attempts to rotate factors 90˚ from each other with the intent of keeping them uncorrelated. There are two principal types of orthogonal rotation methods i.e., quartimax and varimax. The *varimax* method, which is utilised in this research, help in distributing the variable values among the three factors (Yong and Pearce, 2013). This approach has been utilised in similar SP studies (Walker and Brammer, 2012; Zhu and Sarkis, 2004). Tables 4.10 and 4.11 are the unrotated and rotated factor matrix respectively, showing only factor loadings above 0.4 in absolute value. A benchmark of factor loadings of 0.4 and above is consistent with the EFA and sustainability literature (Delmonico et al., 2018; Field, 2013; Hasselbalch et al., 2014).

Table 4.10: Unrotated factor matrix

Variables	Factor 1	2	3
Policy to enhance transparency	0.818		
Policy on ethical practices	0.787		
Policy to ensure sus. eco. dev.	0.785		-0.417
Engages in social activities to develop communities	0.765		
Donate to communities	0.737		
Sources from local suppliers to provide economic benefit to communities	0.733	-0.455	
Policy to provide education & training to develop communities	0.715		
Safe movement of products	0.696		
Ensures suppliers abide by all minimum standards & laws	0.668		
Policy on disabilities	0.639		
Policy to improve living conditions & the economy	0.632		
Checks & prevents pollution	0.628		
Purchase environmental-friendly products from MWBE	0.613		
Policy to respect diversity of employees	0.579		
Project locations are operated in a safe manner	0.572		

Extraction Method: Principal Axis Factoring.

a. 3 factors extracted. 11 iterations required.

As it can be inferred by the data in Table 4.10, all the high loadings of the variables are loaded into factor 1, a similar occurrence to the one in Table 4.8 where factor 1 alone accounted for 51% of the variance. To normalise this difference, researchers are advised to use an appropriate rotation method (Field, 2013; Pallant 2010). As stated above, varimax rotation, which is the most suitable method, was utilised in this research and the result of this rotation is as presented in Table 4.11.

Table 4.11: Rotated factor matrix

Variables	Factor 1	2	3
Sources from local suppliers to provide economic benefit to communities	**0.820**		
Policy to provide education & training to develop communities	**0.764**		
Donate to communities	**0.738**		
Engages in social activities to develop communities	**0.699**		0.454
Policy to respect diversity of employees	**0.636**		0.560
Policy to ensure sus. eco. dev.	**0.450**	0.448	
Policy to improve living conditions & the economy		**0.732**	
Policy to enhance transparency		**0.729**	
Ensures suppliers abide by all minimum standards & laws		**0.624**	
Purchase environmental-friendly products from MWBE		**0.619**	
Policy on ethical practices		**0.587**	
Checks & prevents pollution		**0.581**	0.477
Policy on disabilities			**0.737**
Safe movement of products	0.408		**0.423**
Project locations are operated in a safe manner			**0.409**

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.[a]

a. Rotation converged in 8 iterations.

Following the rotation, three clusters evolved from the groupings in the three factors shown in Table 4.11. Based on the common characteristics of the clustered variables, the factors are named *"social and community improvement (SCI)", "economic and environmental improvement (EEI)" and "equality and safety improvement (ESI)"* (Reio and Shuck, 2015). The three clusters that evolve from the varimax rotation exercise are thereafter loaded into the factors (*Social & Community Improvement, Economic & Environmental Improvement* and *Equality & Safety Improvement)* as indicated in Table 4.12.

Table 4.12: Result of the exploratory factor analysis

Variables	Rotated Factor Loadings (n= 51)		
	SCI	***EEI***	***ESI***
Sources from local suppliers to provide economic benefit to communities	**0.820**	0.167	0.235
Policy to provide education & training to develop communities	**0.764**	0.303	0.095
Donate to communities	**0.738**	0.313	0.165
Engages in social activities to develop communities	**0.699**	0.176	0.454
Policy to respect diversity of employees	**0.636**	0.195	0.560
Policy to ensure sus. eco. dev.	**0.450**	0.448	0.169
Policy to improve living conditions & the economy	0.229	**0.732**	0.081
Policy to enhance transparency	0.367	**0.729**	0.294
Ensures suppliers abide by all minimum standards & laws	0.172	**0.624**	0.374
Purchase environmental-friendly products from MWBE	0.296	**0.619**	0.097
Policy on ethical practices	0.146	**0.587**	0.268
Checks & prevents pollution	0.074	**0.581**	0.477
Policy on disabilities	0.378	0.323	**0.737**
Safe movement of products	0.408	0.389	**0.423**
Project locations are operated in a safe manner	0.230	0.380	**0.409**
Eigenvalues	**7.623**	**1.591**	**1.002**
% of variance	**50.82**	**10.60**	**6.67**
Cronbach alpha (a)	**.894**	**.862**	**.747**

It is worthy to note that whereas the exclusion of a single value in regression analysis can affect the rest values, in factor analysis, it is different. The exclusion of values in factor loadings does not affect the entire factor loadings. Hence, there is no need to recalculate the factor loadings. The Factors' loadings derived from the EFA showed that both Factor 1 - *Social & Community Improvement (SCI)* and Factor 2 - *Economic & Environmental Improvement (EEI)*, have the highest loadings of six items each, while Factor 3 - *Equality & Safety Improvement (ESI)* has a factor loading of three items. Factors 1 and 2 also account for the highest eigenvalues and an accumulated variance of 68% as noted in Table 4.8. The EFA results did not only further demonstrate the correlation between the factor loadings, but also established the underlying relationship between the variables. For instance, the result

shows that firms can improve their economic and environmental performance by simply checking and preventing pollution. It also shows that by having the policy to provide education and training to develop communities, they are likely to improve their performance on social and community issues. On a much broader view, the result also indicates that the safe movement of products could lead to economic savings and reduced environmental impacts. This assumption is supported by the factor correlation matrix as shown in table 4.13, which indicates a significant relationship between the three factors. This is quite an interesting result and indicates, that the implementation of economic and environmental driven initiatives can lead to social and community improvement as well as equality and safety improvement. Similarly, the result indicates that the implementation of equality and safety driven initiatives can result in social and community improvement and economic and environmental improvement. Lastly, this result also indicates that the realisation of economic and environmental improvement and equality and safety improvement can be achieved via the implementation of social and community-driven initiatives.

Table 4.13: Factor Correlations matrix

	Factors	SCI	EEI	ESI
SCI	Pearson Correlation	1	.628**	.717**
	Sig. (1-tailed)		.000	.000
	N	51	51	51
EEI	Pearson Correlation	.628**	1	.698**
	Sig. (1-tailed)	.000		.000
	N	51	51	51
ESI	Pearson Correlation	.717**	.698**	1
	Sig. (1-tailed)	.000	.000	
	N	51	51	51

**. Correlation is significant at the 0.01 level (1-tailed).

The next section presents the Cronbach *(α)* analysis done and results obtained in this research.

4.6 Reliability analysis

To test the reliability of the EFA in this research, Cronbach's alpha coefficient criterion was utilised as demonstrated below. The need for such an analysis has been explained in the methodology chapter of this research. Cronbach's alpha *(a)* is the most common measure of scale reliability (Delmonico et al., 2018; Field, 2013; Hair et al., 1998; Walker and Brammer, 2012), which tests the possibility that the same scores can be obtained by using a specific scale if this scale is administered at a different point. Equation 1 provides the standardised approach to Cronbach's alpha *(a)*.

Eq. 1
$$a = \frac{N^2 \overline{\mathbf{cov}}}{\sum \mathbf{s}^2_{\mathbf{item}} + \sum \mathbf{cov}_{\mathbf{item}}} \qquad (1)$$

The numerator of Eq. 1 is the total number of items *(N)* squared and multiplied by the average covariance between items, while the denominator denotes the total sum of all the items in the inter-item correlation matrix (variance-covariance matrix) (Field, 2013). In this research, the Cronbach's *a* test shows good reliability for the three factors *(SCI 0.894, EEI 0.862* and *ESI 0.747* respectively*)* and therefore our results are consistent with the literature on reliability, which suggested *a* values between 0.7 and 0.8 as good (Doloi et al, 2012; Field, 2013; Kline, 1994). These *a* results not only show the internal consistency of the scales used in this research but further increase the overall confidence of the research strategy, the data collected and the conclusions arrived at with regards to the validity of the scales used. See also McMurray et al. (2014), Delmonico et al. (2018), Walker and Brammer (2012) and Yusuf et al. (2013) where Cronbach's *a* has been utilised to test reliability in similar research but in a different context. For clarity, Cronbach's *a* test analysis for the three factors in this research is produced hereunder.

The analysis for the first factor *(SCI)* is shown in Tables 4.14a and 4.14b. This table reflects a good level of consistency and reliability *(a= 0.894)* of the data. For instance, going through the values in the *Corrected Item-Total Correlation* column of Table 4.14b reveals no low value (i.e. <0.3) indicating that all the items correlate well. Also, a look at the *Cronbach's*

Alpha if Item Deleted column shows that the values are below *(a= 0.894)*. The values in this column make up the overall *a* if the corresponding item is not analysed in the statistics. Considering that our statistics have lower values, the removal of items cannot improve the overall reliability, that is, the *a*, which therefore suggest the internal consistency and validity of our scale is good (Field, 2013; Pallant 2010).

Table 4.14a: Cronbach's a reliability statistics for Factor 1

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.894	0.902	6

Table 4.14b: Item-total statistics for Factor 1

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Sources from local suppliers to provide economic benefit to communities	18.63	16.158	0.774	0.693	0.867
Policy to provide education & training to develop communities	18.86	16.601	0.773	0.618	0.869
Donate to communities	19.02	15.420	0.751	0.662	0.869
Engages in social activities to develop communities	18.90	15.130	0.762	0.685	0.867
Policy to respect diversity of employees	18.73	16.363	0.752	0.657	0.871
Policy to ensure sus. eco. dev.	19.29	15.732	0.562	0.420	0.887

The analysis for Factor 2 *(EEI)* is shown in Tables 4.15a and 4.15b. As the first factor, this factor also shows a very good level of consistency and reliability *(a= 0.862)* of the data. No values (<0.3) were found in the *Corrected Item-Total Correlation* column of Table 4.15b and the *Cronbach's Alpha if Item Deleted* column shows that there is no value greater than the *(a= 0.862).* This demonstrates a good level of internal consistency in the analysis as opined by Field (2013).

Table 4.15a: Cronbach's a reliability statistics for Factor 2

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.862	0.869	6

Table 4.15b: Item-total statistics for Factor 2

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Policy to improve living conditions & the economy	19.02	13.180	0.701	0.574	0.832
Policy to enhance transparency	19.25	11.354	0.792	0.673	0.811
Ensures suppliers abide by all minimum standards & laws	19.06	13.256	0.683	0.492	0.835
Purchase environmental-friendly products from MWBE	19.78	11.453	0.627	0.431	0.852
Policy on ethical practices	19.29	14.132	0.601	0.412	0.850
Checks & prevents pollution	18.98	12.820	0.604	0.414	0.847

Finally, the analysis for Factor 3 *(ESI)* is shown in Tables 4.16a and 4.16b. This factor has a lower reliability score *(a= 0.747)* compared to Factors 1 and 2. However, this reliability score is high considering that it contains only three items. As argued above, Cronbach's *a* score > 0.7 is deemed highly reliable and acceptable (Hair et al. 1998; Kline, 1994). With regards to consistency in the dataset, Table 5.16b shows that values in both the *Corrected Item-Total Correlation* column and *Cronbach's Alpha if Item Deleted* column are (>0.3) and less than the *(a= 0.747)* respectively, thereby indicating good level of correlation between the variables and internal consistency of the scale.

Table 4.16a: Cronbach's a reliability statistics for Factor 3

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.747	0.748	3

Table 4.16b: Item-total statistics for Factor 3

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Policy on disabilities	8.84	1.575	.567	.323	.669
Safe movement of products	8.51	1.655	.584	.341	.653
Project locations are operated in a safe manner	8.37	1.518	.571	.327	.666

4.7 Multiple regression analysis

A hierarchical multiple regression analysis was conducted to test the research hypotheses proposed in the literature review which is also in response to research RQ5 and RQ6. The hypotheses seek to understand the influence firms' sustainability initiatives (i.e. ISO 14001 certification and UNGC initative) and clear SP strategy have on all three interlinked SP practices (1. social and community improvement - SCI, 2. economic and environmental improvement - EEI, and 3. equality and safety improvement - ESI). In terms of validity and reliability, we averaged all items belonging to each factor and variables to obtain overall construct values. Next, normal probability plots were performed to ensure that each of the measures was normally distributed. Table 4.17 shows the results of descriptive statistics and correlation analysis. The results show relatively weak correlations between the independent variables (the largest VIF score is 2.94 and below the maximum level of 10), which indicates

low multicollinearity among the variables, which is important for the subsequent regression analysis (Konishi, 2014).

Table 4.17: Descriptive statistics and bivariate correlations

	1	2	3	4	5	6	7	8	9
1. Firm size	1								
2. Firm turnover	0.525**	1							
3. Time applying SP	0.082	0.097	1						
4. Clear SP strategy	-0.027	0.056	0.114	1					
5. ISO 14001 certified	0.363**	0.206	-0.213	0.060	1				
6. UNGC initiative	-0.282*	0.015	0.081	0.056	0.079	1			
7. Social & community	0.281*	0.143	-0.107	0.189	0.594**	0.169	1		
8. Economic & environmental	0.401**	0.420**	-0.198	0.264	0.464**	0.095	0.628**	1	
9. Equality & safety	0.470**	0.248	-0.098	0.207	0.456**	-0.145	0.717**	0.698**	1
Mean	2.820	3.490	1.860	2.351	3.800	3.150	3.781	3.846	4.287
Standard deviation	1.144	0.880	0.800	0.504	0.428	0.488	0.789	0.703	0.592

The multiple regression results of each step are shown in Table 4.18. Initially, the three control variables (i.e., firm size, firm turnover and the period firms have been applying SP) were considered in the regression model as they may influence SP practices (Galbreath, 2010; Walker and Brammer, 2012; Yook et al., 2018; Yusuf et al, 2013). The base models Model 1, Model 4 and Model 7 indicate that only the size of the firms influences all three SP interlinked practices. In Model 2, Model 5 and Model 8 the independent variable *Clear SP strategy* was entered into the regression equations and all three were significant (for Model 2 F value is 3.274 with $p < 0.01$, for Model 5 F is 8.776 with $p < 0.01$ and for Model 8 with F value is 5.454, $p < 0.01$). By the same token, adding the two SP initiatives as independent variables into the regression model all three equation was also significant (for Model 3 F value is 6.277 with $p < 0.001$, for Model 6 F is 7.563 with $p < 0.001$ and for Model 9 with F value is 5.506, with $p < 0.001$).

Table 4.18: Regression results for interlinked SP practices

Dependent variables	SCI			EEI			ESI		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Constant	3.783***	3.713***	2.806***	3.169***	3.090***	2.631***	3.871***	3.817***	3.599***
Control variables									
Firm size	0.197*	0.211**	0.173*	0.154*	0.169**	0.181**	0.243***	0.254***	0.200**
Firm turnover	-0.010	-0.033	-0.088	0.226**	0.201*	0.162*	-0.001	-0.018	-0.015
Time applying SP	-0.281**	-0.322**	-0.204*	-0.294***	-0.340***	-0.310***	-0.143	-0.175*	-0.106
Direct effects									
Clear SP strategy		0.395*	0.315*		0.448***	0.422***		0.306**	0.267*
ISO 14001 certified			0.816***			0.297			0.359*
UNGC initiative			0.134**			0.097*			-0.009
F	2.988**	3.274**	6.277***	7.834***	8.776**	7.563***	4.358**	5.454**	5.506***
R^2	0.160	0.222	0.461	0.333	0.433	0.508	0.258	0.324	0.373
R^2 *(adjusted)*	0.107	0.154	0.388	0.291	0.384	0.441	0.211	0.265	0.287

*p<0.05, **p<0.01, ***p<0.001

Model 2 in the multiple regression shows that clear SP strategy is positively related to social and community interlinked SP practices (β=0.395, $p < 0.05$) thus supporting H1a. Results of Model 3 show that ISO 14001 certification and UNGC initiatives undertaken by the O&G firms are also significantly associated with social and community interlinked SP practices. Thus, H1b is supported. Note that adding the SP related initiatives to the model yielded a significant change to R^2 - from Model 2 (0.154) to Model 3 (0.388) - indicating that the addition of these initiatives contributed significantly to the predictive power of the model. These results indicate that those O&G firms that invest in social and community interlinked SP practices not only have a clear SP strategy but also signup to sustainability initiatives. Similar findings were observed in the study of Cetindamar and Husoy (2007).

For economic and environmental interlinked SP practices, clear SP strategy has a significant positive effect, which supports Hypothesis H2a. In Model 6, ISO 14001 certification and UNGC initiatives were added, improving the predictive power of the model as the R^2

increased from 0.384 (Model 5) to 0.441 (Model 6). However, only the coefficient of the UNGC initiative was statistically significant, indicating that only the UNGC initiative was directly related to economic and environmental interlinked SP practices, while ISO 14001 certification was not. The results in this study corroborate with the criticism regarding ISO 14001 certification when not accompanied by concrete improvements in economic and environmental performance. See also the studies of Vílchez (2017), and Aravind and Christmann (2011). In contrast, those firms that participate in UNGC shows commitment and take concrete steps toward ending global poverty while protecting the environment (McKinsey and Company 2004; Rasche and Waddock, 2014). Hence, hypothesis H2b is only partially supported.

Table 4.19: Summary of hypotheses results

Hypothesis	Support/don't support
H1a: Those firms with a clear SP strategy have implemented measures of social and community improvement	Supported
H1b: Those firms that take sustainability initiatives have implemented measures of social and community improvement	Supported
H2a: Those firms with a clear SP strategy have implemented measures of economic and environmental improvement	Supported
H2b: Those firms that take sustainability initiatives have implemented measures of economic and environmental improvement	Partially supported
H3a: Those firms with a clear SP strategy have implemented measures of equality & safety improvement	Supported
H3b: Those firms that take sustainability initiatives have implemented measures of equality & safety improvement	Partially supported

Source: Author

Concerning the equality and safety interlinked SP practices, the results show a positive relationship with clear SP strategy as it is demonstrated by Model 8. Thus, hypothesis H3a is supported. Adding the two initiatives to the model, the results indicated that those firms with ISO 14001 certification have implemented equality and safety interlinked SP practices while there is no indication that this SP practices is related to participation of O&G firms in

UNGC initiative. Therefore, hypothesis H3b is only partially supported. The results posit that the ISO 14001 certification helps O&G firms in promoting human rights, gender equality, cultural diversity and culture's contribution to sustainable development (Curkovic and Sroufe, 2011; Prajogo et al., 2012; Sebhatu and Enquist, 2007). Note, that in comparison with the other two SP interlinked practices the predictive power of the model is evident but not that strong (the value of R^2 was initially 0.211 for Model 7, then increased to 0.265 (Model 8) and finally to 0.287 for Model 9. Nevertheless, after the factors of sustainability initiatives are included in Model 9, the effect of a clear SP strategy is only slightly weakened. The summary of results from the hypotheses testing is shown in Table 4.19.

4.8 Impact of SP practices on firms' performance

An important aspect of SP practices involves the benefits derived from it. Usually, those firms that aspire to implement SP practices expect some sort of benefits from such practices. There are different approaches used to measure firm performances (Ahi and Searcy, 2015; Islam et al., 2017a). A suitable performance metrics deemed appropriate in this research context was modified from the study of Yusuf et al. (2013) which also investigated the O&G sector. This approach is in line with Ahi and Searcy (2015) who opined that performance metrics should be designed to reflect the environments been observed. The measures include vital elements that could directly or indirectly benefit from innovative approaches of the procurement function and included both financial and non-financial metrics.

4.8.1 Cross-tabulation of firms' perceived performance measures

The impact of SP practices on the key performance measures of firms was measured on a Likert scale of (5 very positive impact – 1 very negative impact). The results suggest a good level of positive impact on all *13 key performance measures* used in this research as they all recorded a score of (≥50%) to SP practices having a positive impact (see Table 4.20). For example, on *quality of products/services*, 29% of the population considered SP practices to have a very positive impact, while 63% noted that SP practices have some positive impact, while a minority (8%) of the respondents said no impact. This finding indicates that SP practices do help improve the quality of products and services rendered by firms within the

sector. Although this result is in line with a similar study of the O&G sector conducted by Yusuf et al. (2013), it contradicts the extant literature, which raises concerns about the quality of sustainable products (Brammer and Walker, 2011; Islam et al., 2017b).

Table 4.20: Perceived impact of SP practices on key performance measures (%)

Performance measures	Very positive impact	Some positive impact	No impact	Some negative impact	Very negative impact
Quality of products/services	29.4	62.7	7.8	-	-
Net profit	13.7	60.8	21.6	3.9	-
Procurement lead times	14.3	36.7	40.8	6.1	2.0
Reduced costs	20.0	40.0	24.0	16.0	-
Sales and revenue	16.0	62.0	16.0	6.0	-
Market share	14.9	68.1	8.5	6.4	2.1
Customer loyalty	36.7	51.0	6.1	-	6.1
Reduced risks	35.3	51.0	2.0	9.8	2.0
Innovation	25.5	58.8	5.9	3.9	5.9
Use of advanced technology	14.0	54.0	20.0	10.0	2.0
Competitive advantage	19.6	60.8	13.7	2.0	3.9
Flexibility of processes	12.0	48.0	28.0	2.0	10.0
Internal rate of return	7.8	47.1	29.4	9.8	5.9

4.8.2 Confirmatory factor analysis of firms' perceived performance measures

In addition to the cross tabulation presented above, the researcher went a step further and performed a confirmatory factor analysis using structural equation modelling (SEM) with the aid of SmartPLS to validate the measures used in this research. The reason for this is that the key performance measures used to measure the firms' performances are valid and pre-existing in the sustainability literature (Yusuf et al., 2013). SmartPLS is a statistical technique used for analysing complex multivariable relationships among exogenous and endogenous variables, and for confirming existing theories and concepts (Chin and Newsted, 1999). In this study, SmartPLS is needed for the latter purposes, i.e. confirmation of existing theories. However, it is important to determine the relationship between the latent variables of the performance measures in this study. SmartPLS has been used in similar sustainability studies

(Simpson and Sroufe, 2014; Jabbour et al., 2014). This study's sample size *n* = 51 is appropriate in SmartPLS, which has a recommended minimum sample size of 30 – 100 cases (Chin and Newsted, 1999; Reinartz et al., 2009).

Table 4.21: Confirmatory factor analysis of key performance measures

Variables	Financial	Efficiency	Reputation
Sales and Revenue	0.865		
IRR	0.760		
Competitive advantage	0.742		
Reduced costs	0.741		
Net profit	0.592		
Technology		0.823	
Reduced risks		0.775	
Procurement lead times		0.738	
Innovation		0.720	
Flexibility of processes		0.649	
Quality of products		0.484	
Market share			0.895
Customer loyalty			0.709
Composite reliability	0.860	0.854	0.787
Average variance extracted	0.555	0.499	0.651
Fornell-Larcker criterion	0.745	0.707	0.807

To measure the performances, the scales were classified into three different categories – *Financial, Efficiency* and *Reputation* to reflect the impact on firms' performances. According to Hulland (1999), results from SmartPLS analysis should be analysed and interpreted sequentially by first assessing the reliability and validity of the measurement model and then the structural model. Results of the measurement model, which shows acceptable values for item reliability, internal consistency reliability, convergent validity, and discriminant validity, are presented in Table 4.21. All the variables have loadings above 0.40, composite reliability greater than 0.70, average variance extracted are also within and above 0.5 with a well-

established discriminant validity (0.745, 0.707 & 0.807) as shown in Table 4.21 (Abd-El-Fattah and Fakhroo, 2012; (Bagozzi and Yi, 1988; Hulland, 1999; Wong, 2013). However, it is important to note that the *quality of products*, which loaded low (0.484) is shocking.

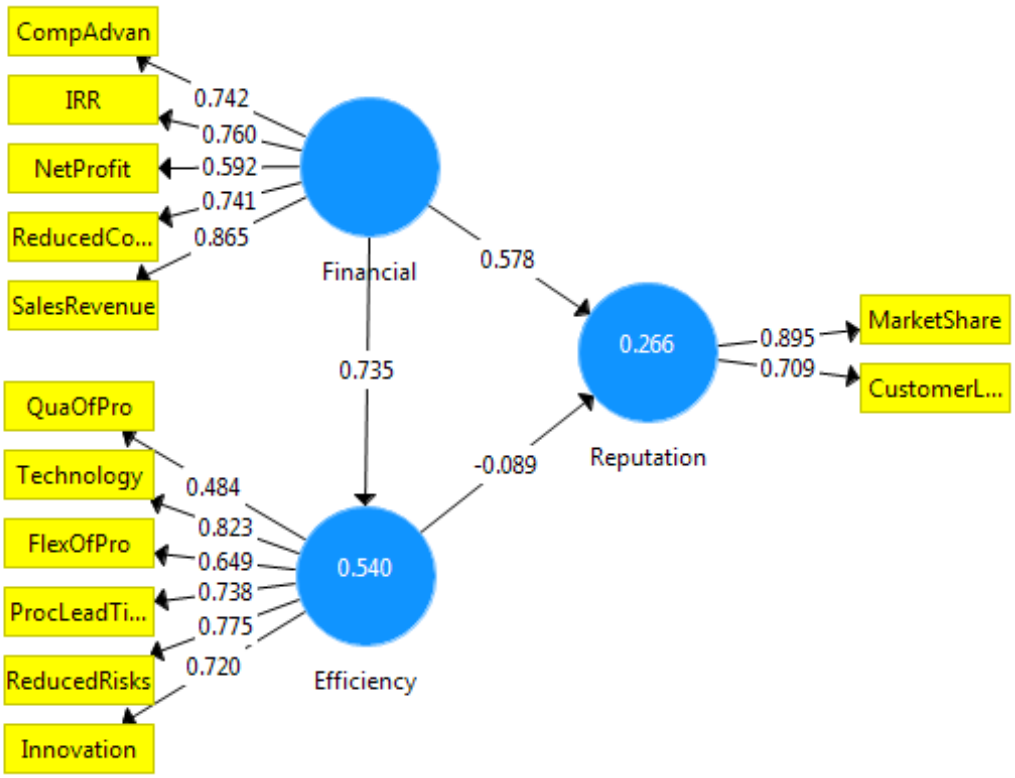

Figure 4.3: Path model analysis of firms' perceived performances.

This result is far different from the face value as presented in the cross tabulation with about 92% of the respondents noting that SP has a positive impact on product quality. This result also contradicts the findings of Yusuf et al. (2013) where sustainability initiatives are found to have a positive impact on the quality of products. Some positive outcome observed in the confirmatory factor analysis results is the high loadings of *sales and revenue*, *technology*, *market share*, which indicate a high positive correlation between *sales and revenue* and SP practices, *technology* improvement and SP practices, as well as *market share* and SP practices respectively.

The results of the structural path model are provided in Figure 4.3. The analysis shows a good level of the constructs used and the model goodness-of-fit. The R^2 (coefficient of determination) is 0.540 for *Efficiency* and 0.266 for *Reputation,* indicating that *Financial* moderately explains 54% of the variance in *Efficiency* while *Financial* and *Efficiency* both weakly explain 26.6% of the variance in *Reputation* respectively (Chin, 2010; Hair et al., 2011). The R^2 is tipped to be the most appropriate measure for model fit in a PLS analysis (Hulland, 1999). It is, therefore, submitted that with the R^2 values reported, the data supports the present path model. In addition, the path coefficient of the inner model is reported to show their significant level. It shows that *financial* improvements positively influence both firms' *efficiency* and *reputation* with a score of 0.735 and 0.578 respectively, while *efficiency* negatively influences firms' *reputation* with a score of -0.089.

To further investigate the path coefficient of the inner model, a bootstrapping analysis was performed to obtain *T-statistics* values. The recommended value of *T-statistics* analysis is 1.96 and above (Hair et al., 2011). This study's *T-statistics (Efficiency → Reputation 0.312, Financial → Efficiency 11.504, Financial → Reputation 2.288)* indicates that there is no significant relationship between *Efficiency and Reputation*. These results corroborate the earlier path coefficient results of the inner model achieved with the *Total Effect* as presented in Figure 4.3. The results indicate that improvement in firms' efficiency has no significant relationship with firms' reputation. Interestingly, these findings are new within the SP literature where studies that have investigated the relationship between efficiency and reputation are scarce.

The effect of SP practices on firms' performances has been established through the cross tabulation and confirmatory factor analysis using SEM-PLS with the aid of SmartPLS. The items high loadings indicate that the implementation of SP practices does positively impact on firms' performances. The analysis also confirmed further that while firms' financial improvements significantly influence firms' reputation and efficiency, firms' efficiency does not have any significant influence on their reputation. The results also show that the implementation of SP practices can, for example, significantly lead to technological

improvement, increase market share and boost sales and revenue. This is also the case in all the other measures used in this study as presented above.

4.9 Summary

In summary, this chapter offers an in-depth data analysis conducted in this research. To commence the chapter, the respondents' profiles were examined to assess the credibility of the data sources. Preliminary qualitative data were presented in ranked order, ranking the drivers and barriers in accordance with the number of times they were mentioned in this research. Thereafter the quantitative data were presented beginning with the SP dimensions being implemented across the Nigerian O&G sector and their level of importance to firms. This chapter then moves on to the main data analysis - EFA. Before the analysis, the researcher provided an in-depth discussion on the appropriateness of the sample size by carrying out KMO and Bartlett's test of sphericity as well as utilising the anti-image correlation matrix as advised by Field (2013). The factor analysis utilised principal axis factoring, which is in line with the proposed aim of using factor analysis – to explore the unobserved variables of SP practices (Reio and Shuck, 2015). Descriptive statistics of the research data was reported in accordance with suggested guidelines for scholarly authors such as Field (2013). In addition, the researcher used Kaiser's criterion for the factor retention, which was checked with Cattell's scree plot test as suggested by Reio and Shuck (2015). Upon extraction and retention, the factors were rotated using the varimax rotation method to allow for easy interpretation of the data, after which the attributes were loaded accordingly. Before opting for the orthogonal varimax rotation, the researcher tried the other methods, but all returned negative values different from our expected outcome. To test the reliability of the factor analysis, Cronbach's *a* was utilised and all the factors tested were found reliable (>0.7).

Multiple regression was performed with respect to the hypotheses developed in this research. The hypotheses were developed in line with the extant literature and all measurement-of-fit for the models emanating from the analysis were reported. The outcome of the hypotheses was reported in Table 4.19. To conclude the data analysis

chapter the researcher used two approaches to examine the perceived impact of SP practices on firms' performance. First, a cross-tabulation was used with the corresponding discussion and validated with confirmatory factor analysis. The next chapter presents an in-depth discussion of the research findings in relation to the proposed objectives and literature.

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.1 Introduction

This chapter present discussions of the research findings as contained in chapter four. Whereas assumptions and some discussions had been presented earlier in the previous chapter - with relation to the research findings and objectives - it is important that the key issues addressed in this research are specifically synthesised, interpreted and evaluated against the existing literature. In other words, this chapter intends to highlight the key contributions of this research to sustainable procurement (SP) and the wider sustainability literature. In order to achieve this, this chapter consulted the research objectives and questions. This process enabled the researcher to reflect on the main research gaps identified in this research and reproduced below.

5.2 Re-evaluation of research gaps

A detailed literature review conducted on SP practices in this research, specifically with reference to the Nigerian context, revealed the following:

(i) lack of research studies on SP practices within the Nigerian O&G sector

(ii) lack of research studies that examined the drivers and barriers to SP implementation within the Nigerian O&G sector

(iii) lack of theoretical evidence on the underlining relationships among SP practices that firms need to attain corporate sustainability.

(iv) lack of theoretical evidence on the impact of clear SP strategy, sustainability initiatives, such as ISO 14001 certification and UNGC initiative on SP practices

(v) evidence of mixed perceptions on the impact of SP implementation on firms' performances.

This research was instigated to fill the gaps identified above and upon which quantitative data were sought using the survey strategy with the aid of the questionnaire, which was distributed using the internet-mediated approach. The empirical data collected were then

analysed and presented in chapter four after screening and cleaning to ensure its validity. In general, the findings of this research extend the literature on SP practices and the wider sustainability literature. The findings suggest SP practices are interrelated and implemented across the Nigerian O&G sector and that its implementation positively contributes to firms' performances. The subsequent sections provide a clear discussion of how this research has been able to fill the gaps identified in this research.

5.3 Definition and implementation of SP practices across the Nigerian O&G sector

Due to the lack of literature on SP practices within the context of the study, it was important to establish whether the firms within the sector understand the concept and engage in SP practices. It was also paramount that the level of engagement, e.g., the dimensions of SP practices implemented across the sector is highlighted. These dimensions were determined through the extant literature and the empirical data collected as *environmental, diversity, human rights, health and safety, philanthropy, procuring from small and local suppliers, community development, product responsibility* and *sustainable economic development*. Although not within the purview of this research, the meaning of SP varies depending on context (Sourani and Sohail, 2011; Walker et al., 2012). The data indicates evidence of a clear understanding of SP practices along the TBL with emphasis on the needs of local stakeholders. For instance, the majority of the definitions obtained highlighted environmental, economic and social dimensions of the TBL. This is a useful observation since the implementation of SP practices cannot take place without an understanding of its ethos. This finding also supports the broad views on the SP definition offered within the literature. It is therefore argued in this research that the broad views on SP practices cannot deter implementation unless there is a lack of commitment in that direction. In fact, it is supposed to broaden management's understanding of the complexity in the business environment especially as it relates to sustainability issues.

The findings of this research also indicate that SP practices are being implemented across the Nigerian O&G sector, with the environmental dimension found to be more prevalent. The fact that there are environmental regulations and policies governing the O&G sector

could force this result since firms are assumed to be more responsive to regulatory pressure. This finding also demonstrates the effect of environmental campaigns embarked on, including the use of social media, by citizenry and NGOs about the negative effects of O&G activities on the environment (Nwagbara, 2013). This finding is consistent with the existing literature where the emphasis is on the environmental dimension (see Islam et al., 2017b; Walker and Brammer, 2009; Young et al., 2016). However, we must note that the environmental implications of O&G operations are higher compared to the public or even other private sectors and, therefore, it can be implied that the sector is more likely to focus on environmental issues, especially within the Nigeria context where oil spills and gas flaring are extremely rampant.

Other widely implemented dimensions of SP practices observed are health and safety and procuring from small and local suppliers, followed by human rights and community development practices. Health and safety issues are a major internal concern of the O&G sector in general, considering its enormous consequences if not properly handled. The running cost of dealing with the aftermath of incidents at work or oil spills are estimated at millions of dollars (Chevron, 2017; Oppong, 2014). This finding, therefore, signifies the sector's commitment to health and safety issues to reduce the number of incidents at work. In view of the local content Act currently being implemented across the Nigerian O&G sector, the implementation of procuring from small local suppliers' dimension is not surprising. This is because of the seriousness attached to the implementation of the local content Act by the Nigerian government, who upon enactment of the Act set up an active parastatal to ensure its full implement including monitoring to promote and develop local stakeholders. Brammer and Walker (2011) who conducted international empirical research on SP practices also observed that publicly owned organisations broadly embedded health and safety dimension as well as buying from small and local supplier dimension. Similar findings were also observed by McMurray et al. (2014) and Walker and Brammer (2009).

The least embedded dimensions of SP in this research are philanthropy and product responsibility. Philanthropy dimension involves goodwill activities engaged in for the

progress and benefit of communities, organisations and individuals, whilst product responsibility dimension involves for example commitment to cleaner production, the design of environmentally friendly products, reduce wastage and recycling. The findings indicate that these dimensions are not fully embraced within the sector. The issue of variation in the dimensions of SP practices implemented across sectors is not new within the literature, as firms tend to engage in SP practices on a priority basis (Islam et al., 2017b). Given the complexity of the O&G sector, it would be unrealistic to expect firms to have fully embedded all the dimensions of SP. With regards to the product responsibility dimension, it is important to emphasise that O&G products are typically not ecologically friendly neither can they be easily substituted for sustainable alternatives, hence the campaign for greener source of energy regeneration, which is claimed to be very challenging (Biresselioglu et al., 2018; Fryer, 2009). However, efforts to reduce the Nigerian O&G sector's GHG, gas flaring, water usage, spills, accidents and to improve employees and overall community well-being, as proposed in SP practices, will go a long way to mitigating the impending dangers of global warming and climate change.

The finding on the philanthropy dimension is somewhat consistent with the existing literature (McMurray et al., 2014). For example, Islam et al. (2017b) seem to be among the few studies to find this dimension of SP well embedded across public and private sector firms in Saudi Arabia. The fact that this dimension is solely voluntary makes implementation less important. However, as indicated in this finding, firms with the right leadership and commitment to SP practices seem to embed this dimension to improve their reputation, gain customer loyalty and increase sales.

5.4 Drivers and barriers to SP practices

To further strengthen the literature on drivers and barriers to SP practices, this research collected empirical data as presented in the findings chapter. The research findings on drivers of SP practices are highlighted in Table 4.2. This research found amongst others, that *government regulations and policies* is the highest ranked driver of SP practices within the Nigerian O&G sector, followed by *firm policies and strategies, community and environmental*

development and *local content Act* ranked 2nd, 3rd and 4th respectively. These results, especially with reference to the highest ranked driver of *government regulations and policies*, corroborate the existing literature, which stressed on the role of institutional drivers for implementing SP (Abdalla and Siti-Nabiha, 2015; Giunipero et al., 2012; Ruparathna and Hewage, 2015; Walker et al., 2008; Young et al., 2016). In addition, with a total of 26 respondents the finding indicates the government ultimate role of ensuring a sustainable environment for its citizens (Reinhardt, 1998; Yusuf et al., 2013). This finding is in parallel with the extant literature (Abdalla and Siti-Nabiha, 2015; Bansal, 2005; Brammer and Walker, 2011), and the study of Hine and Preuss (2009) where the UK government is noted to be a major driver of sustainability practices. See also Berns et al. (2009), Giunipero et al. (2012) and Ruparathna and Hewage (2015) where similar findings were observed. This finding supports the view that firms are in business to make a profit and maximise their long-term survival whilst responding to institutional pressures and confirms the suitability of the intuitional theory relied on.

Although ranked separately, the *local content Act* is a policy implemented by the Nigeria government to encourage the engagement of local enterprises and local citizens in the awards of contracts and employment. Since this driver has not featured in previous SP literature, it is classified as a new discovery. As the result indicates this driver has been instrumental to the implementation of SP practices across the Nigerian O&G sector especially with respect to procuring from small and local suppliers and the employment of locals. These findings, therefore, suggest that firms are more responsive to institutional pressure in the form of government regulations and policies. The Department of Petroleum Resources with this insight should introduce relevant institutional framework compelling firms to implement SP practice across the entire Nigerian O&G sector. This finding also validates the significance of institutional theory for assessing firms' engagement in SP practices.

The need for firms to have in place clear policies and strategies that can help stimulate the implementation of SP practice was confirmed in this research, which ranked *firm policies and*

strategies as the second highest driver of SP implementation. This finding suggests that it is worthless for firms having the right resources or skills for implementing SP practice, without a clear policy or strategy providing the directions and structures on how to operationalise SP practices. The existence of a formal strategic policy can help firms in aligning various aspects of their businesses towards achieving SP objectives. Strategic policy document and a clear direction can help secure the involvement of key stakeholders, such as employees in achieving set targets for engaging in SP practices. This finding is consistent with the existing literature, which noted that a lack of strategy can hinder the implementation of SP practices (Brammer and Walker, 2011; Walker and Jones, 2012; Young et al., 2016). The research findings also indicate the need for *community and environmental development* as a driver for implementing SP practices among the sampled firms. This result attempts to combine the subsequent impacts of engaging in SP practices. For instance, the ultimate goal of implementing SP practices is to achieve sustainability, which comprised of the environment, social and economic. This finding indicates that sampled firms are aware of the positive impact SP practices can bring to the communities and the environment in which they operate.

Surprisingly, *top management support* was not considered a top driver compared to other drivers. This finding contradicts previous studies which suggested that top management support is an important driver for the implementation of SP practices across public and private sector organisations (Giunipero et al., 2012; Walker and Brammer, 2009; Walker and Jones, 2012). Possible assumptions that can be made of this finding is that the Nigerian O&G sector, especially the upstream is a well-structured and consists of firms that have become a behemoth with worldwide affiliates across Europe, USA and UK regions best known for innovative approaches to sustainability implementation (Amaeshi et al., 2006). Hence one would expect these firms to have aligned their sustainability objectives to their overall organisational strategy, thereby limiting the visibility if top management involvement as this result indicates.

Another interesting result found in this research is the low influence of stakeholders to engage in SP practices. This driver is ranked lowest in this research, indicating that although *stakeholder pressure* plays a role in the implementation of SP practices by the sampled firms, this is minimal. Several explanations can be drawn from this finding, for example, stakeholders may be aware of efforts made by the Nigerian O&G sector available in the public domain to bring about sustainable development, stakeholders may not consider sustainability challenges as paramount in the light of economic and political turbulence within the country. Competing necessities like basic human needs, living standards – economic hardship, infrastructure and security, are likely to dominate stakeholders' sense of judgement, especially in the most affected regions of Niger Delta (Amaeshi et al., 2006; Ite, 2007). The lack of awareness of the principles of SP practices on the side of stakeholders can also reduce demand for it (McMurray et al., 2014). However, as stakeholders go beyond local communities, the pressure from policymakers, regulators and the government are evident in this research, which found *government regulations and policies* to be the highest driver of engaging in SP practices. Consequently, supporting the use of institutional theory which noted that coercive, mimetic and normative pressures is crucial to the implementation of SP practices irrespective of country, region or sector, - is highlight supported (Arenas et al., 2009; Roman, 2017; Seuring and Müller, 2008; Young et al., 2016).

Several other drivers e.g., *improve firm performance, competence (i.e., resources, expertise), improve firm reputation, awareness of SP practices, collaboration (i.e., with contractors), gain a competitive advantage, improve health and safety and the existence of CSR practice* were also found as key to the implementation of SP practices within the Nigerian O&G sector. This finding is consistent with the extant literature (Brammer and Walker, 2011; Giunipero et al., 2012; Ruparathna and Hewage, 2015; Walker and Brammer, 2009; Yusuf et al., 2013). For example, McMurray et al. (2014) and Meehan and Bryde (2011) in their research found the need to improve organisational reputation as a key driver for engaging in SP practices. Since SP practices extend beyond firms' own activities into that of their suppliers', collaboration with key suppliers and contractors has become a necessity as

evidence in these research findings, where *collaboration* is found to be a key driver for SP practices within this sector.

Regarding the barriers impeding the implementation of SP practices, this study found fourteen; the majority of which are internally related. For example, these are barriers firms need to improve on, such as having a clear strategic path, committing to sustainability goals, and building a sustainability culture within their structure. The most notable barrier is *insufficient regulations and policies* followed by a *lack of awareness* and *cost of implementation*. Regulations and policies in the form of frameworks and standards that can help stimulate sustainability across different sectors in Nigeria are consistently observed to be absent in the literature (Adebayo, 2015; Ambituuni et al., 2014; Oyewobi et al., 2017). This situation makes the implementation of SP practices challenging for firms since there are no normative approaches. Lack of commitment and weaknesses on the part of the Nigerian government on sustainability-related issues also attributed to this finding (Amaeshi et al., 2006; Ite, 2007). *Lack of awareness* is cited as the second most dominant barrier to SP implementation in the Nigerian O&G sector. This finding validates the argument on the lack of commitment bestowed on sustainability issues by the Nigerian government who is meant to provide leadership by providing appropriate SP frameworks or standards required to operationalise SP practices as obtainable in other committed countries, e.g. UK (Meehan and Bryde, 2015; Walker and Brammer, 2009). To promote awareness, firms within the Nigerian O&G sector could launch campaign programmes solely for promoting SP practices. This finding is consistent with recent studies that investigated developing economies (Hasselbalch et al., 2014; Islam et al., 2017b; McMurray et al., 2014; Oyewobi et al., 2017). Although from a developing country context, this finding contradicts the study of Brammer and Walker (2011), which suggests a lack of awareness does not impede SP implementation. This contradiction stresses the crucial role of government regulations and policy on SP as already argued.

As noted in the SP barriers and drivers' model of this research, the *cost of implementation* is repeatedly cited as a key barrier to SP practices. Similarly, this research found the *cost of*

implementation as one of the highest barriers to SP practice in the Nigerian O&G sector. This finding to some extent validates the SP barriers and drivers' model presented in chapter two of this thesis, where emphasised was made on high upfront cost been the main barrier to SP implementation. However, it faults the initial assumption made in this research that firms within the upstream O&G sector have the financial capability and, therefore, the cost constraint does not apply to firms within the sector. Although this finding is in parallel with the extant literature, it came as a surprise considering our earlier assumption. Possible explanations for this finding could be that the reduction in oil price is affecting their revenue. Furthermore, the high upfront capital needed by O&G firms to commence and sustain the exploration and production of petroleum products, would likely be prioritise over sustainability issues (Brammer and Walker, 2011; Dyllick and Hockerts, 2002), especially in this research context where directives on SP practices are either weak or absent (Idowu and Lambo, 2018; Odoeme, 2013; Orji, 2013; Vaaland et al., 2012).

Lack of resources and *insufficient guidelines on implementation* were also cited as barriers to SP practices in this research by the respondents. For instance, the firms noted expertise and training to be one of the main barriers encountered in the process of implementation. Similar findings have also been observed in the literature (McMurray et al., 2014; Sourani and Sohail, 2011). These findings insinuate that firms within the Nigerian O&G sector are not committing enough resource into achieving sustainability. The findings also indicate the lack of normative approaches within the context of the study. Whereas financial constraint is evident from the research findings, firms must not fail in their responsibility as enshrined in the UN Paris Agreement on climate change, which can also lead to competitive advantage and improve brand image (McMurray et al., 2014; Meehan and Bryde, 2011; Ruparathna and Hewage, 2015; Yusuf et al., 2013). Therefore, commitment to sustainability initiatives is advice to create a sustainable culture within the sector. *Corruption* which has remained an epidemic in Nigeria is also cited as a barrier to SP implementation. This finding supports previous studies, which emphasised on the negative impact of corruption activities on the O&G sector and Nigeria as a nation (Amaeshi et al., 2006; Donwa et al., 2015; Ite, 2007; Nwapi, 2015). This finding suggests that the Nigerian government needs to intensify its

efforts on the fight against corruption. See also McMurray et al. (2014) where corruption was found to hinder the implementation of SP practices.

Other barriers found in this research are *lack of commitment*, *conflicting organisational priorities, lack of an established firm strategy, lack of good infrastructure (i.e. roads), lack of cooperation (i.e. from employees), lack of competent local suppliers, limited benefits* as well as *lack of support from top management*. Roman (2017) in line with the extant literature highlights the role of good leadership style and organisational innovativeness for stimulating SP implementation. The findings above are more related to issues of commitment on the part of the firm, which insinuates that with the right leadership, the adoption and implementation of SP practices can be achieved. See also Walker et al. (2008) and Young et al. (2016).

In summary, this research found that different dimensions of SP practices are widely embedded across the Nigerian O&G sector. However, this implementation is motivated by different factors. For example, the policy framework of the Nigerian O&G has surely played a role in the implementation of SP across the sector. Whereas policy and regulatory frameworks across the Nigeria O&G sector are assumed weak, this sector appears to be the most regulated in comparison to other sectors in Nigeria. For example, unlike the O&G sector, the use of traditional procurement approaches remains predominant in other sectors in Nigeria (Adebayo, 2015; Akinola et al., 2013). The study of Oyewobi et al. (2017) which noted that SP practices are not embedded across the Nigerian construction sector further confirmed this view. This research findings, therefore, indicates that the O&G sector seems to be leading the way towards achieving sustainability in the country, an assumption which supports the researcher's view who noted that the Nigerian O&G sector is more likely than any other sector (including the public sector) to bring about sustainable development in the country in the absence of strict procurement policy and frameworks from the Nigerian government.

Hence, the Nigerian government needs to do more in formalising SP practices, by way of proposing a robust policy or regulatory framework within the public procurement sector. Such effort is likely to act as a formal policy down the supply chain of the country and the O&G sector, in particular, bearing in mind that NNPC, the nation's national oil company, is a key partner in the sector. Initiatives of this nature often lead to a long-term approach to dealing with sustainability challenges. This research has in all fairness responded to the first and second research gaps (lack of research studies on SP practices within the Nigerian O&G sector; lack of research studies that examined the drivers and barriers to SP implementation within the Nigerian O&G sector) identified at the beginning of this chapter.

5.5 The underlying relationship among SP practices

The empirical findings from the exploratory factor analysis (EFA) provide strong evidence to suggest that SP practices are interlinked. The EFA resulted in the extraction of three factors named *Social and community improvement (SCI), Economic and environmental improvement (EEI)* and *Equality and Safety Improvement (ESI)* with a significant correlation. For example, the following was obtained from the *R* matrix: *SCI* and *EEI r*=.628; *SCI* and *ESI r*= .717 and *EEI* and *ESI r*= .698, the significance is at 0.01. This significant finding is in support of the conceptual reasoning of this research which advocates a simultaneously approach to the environmental, economic and social dimensions of sustainability.

5.5.1 Social and community improvement (SCI) factor

This factor *(SCI)* has the highest eigenvalue of (7.623) and explains 51% of the total variance. As it has been observed in the factor loadings, this factor has six items (variables) within it. These include, *Sources from local suppliers in order to provide economic benefit to communities* with 0.820, *Policy to provide Education & Training to develop communities* with 0.764, *Donate to communities* with 0.738, *Engages in social activities to develop communities* with 0.699, *Policy to respect diversity of employees* with 0.636 and *Policy to ensure Sus Eco Dev* with 0.450. *Social and community improvement* is a facet of SP, which is concerned with the social dimensions of the TBL.

The above loadings are in line with the rising number of campaigns for firms within the Nigeria O&G sector to improve the well-being of the society that has brought about some socially directed practice (e.g., CSR within the Nigerian O&G sector). There is evidence from the literature, which suggests that this practice is common within the Nigerian O&G sector (Musa et al., 2013). This finding, therefore, corroborates a key aspect from the literature indicating that firms within the Nigerian O&G sector are committed to implementing CSR measures that deal with the social dimensions of SP practices. Although this is contrary to a plethora of research findings, which argued in favour of environmental measures been more dominant, it signposts the current trend within the context of the study, where communities are becoming more aware of firms' responsibilities to host communities. The social facet of SP practices mainly relates to stakeholders' welfare and community improvement (Islam et al., 2017; McMurray et al., 2014). The loadings in this factor further support this.

From the above, it is assumed that the need to build positive reputation could be the reason why Nigerian O&G firms are giving social issues more priority (Cambie and Ooi, 2008; Nwagbara, 2013). This assumption is aligned with Musa et al. (2013), who argued that the social dimensions of the TBL enrich the corporate reputation of firms within the Nigerian O&G sector.

5.5.2 Economic and environmental improvement (EEI) factor

With an eigenvalue of 1.591, this factor *(EEI)* explains 11% of the total variance. This factor contains two facets of SP, that is, the environment and economic dimensions of the TBL. Although this factor explains 11% of the variance, it has six items. These are: *policy to improve living conditions & the economy* with 0.732 factor loadings, *policy to enhance transparency* with 0.729 factor loadings, *ensures suppliers abide by all minimum standards & laws* with 0.624 factor loadings, *purchase environmental-friendly products from MWBE* with 0.619 factor loadings, *policy on ethical dimensions* with 0.587 factor loadings and *checks & prevents pollution* with 0.581 factor loadings. It is also worth mentioning that these variables are significantly correlated with each other.

The involvement of the upstream O&G sector in improving the environment is a legitimate and righteous initiative considering the negative impact of the sector's exploration and production activities. The research findings show that firms within the Nigerian O&G sector take this aspect of SP practices very seriously, as established in the drivers of SP where *government policies & regulations* and *local content Act* were ranked amongst the highest drivers. Islam et al. (2017a) noted that there is a positive relationship between the adoption of SP and environmental performance. In this research work, these drivers have a direct link to the following items in this factor, *which* explain the implementation of these practices: *checks & prevent pollution, policy on ethical practices, ensures suppliers abide by all minimum standards & laws* and *purchase environmental-friendly products from MWBE*. Further, according to Wagner (2005), there is a positive relationship between environmental and economic performance for firms with environmental driven strategies. Thus, it can be easily inferred through this study that the implementation of economic and environmental sustainability-driven initiatives can lead to both environmental and economic improvements.

It is imperative to note, however, that an important item *(checks & prevents pollution)*, which constitutes a major issue of environmental challenges has the lowest loadings (0.581) in this factor. This result is worrisome considering persistent campaigns on climate change and environmental degradation that are specifically affecting the oil producing communities in Nigeria (Odoeme, 2013). This statistical finding is in line with current reports, which indicates Nigeria is among the highest gas flaring countries in the world (The World Bank, 2018). To some extent, *checks & prevents pollution* item also creates serious doubts on the environmental efforts of the sector. Thus, the Nigerian government should make essential regulatory improvements, whilst making sure that existing regulations are being implemented and monitored across the sector. On the other hand, firms within the sector should carry out their legal duty by adhering to government policies and regulations.

5.5.3 Equality and safety improvement (ESI) factor

Lastly, the *ESI* factor has an eigenvalue of 1.002 with 7% of the total variance explained (Yong and Pearce, 2013). This factor correspondingly with the *SCI* Factor falls under the

social facet of SP practices. The first item *policy on disabilities* loaded highest with 0.737, followed by the second item *safe movement of products* with 0.423 factor loadings, and *project locations are operated in a safe manner* with 0.409 factor loadings. It is important to mention that these variables also have a significant correlation level. A valid reason for this could be that these items are associated with firms' efforts to achieve social sustainability. Social issues such as equality and health and safety at work are gaining popularity due to the failings in the workplace, which are easily brought to public attention through the media. The resulting consequences are fatal and almost irreparable to affected firms, thereby compelling firms to be more proactive in this aspect of the TBL directed at firms' employees (Evans and MacKenzie 2010; Kumar and Schmitz, 2011; Rice, 2009). As confirmed in the statistical finding, efforts made toward improving the work environment can positively affect human right issues. The prevalence of these practices also indicates the sector's commitment to issues of health and safety and employees' welfare, which is becoming an imminent challenge within the O&G sector (Brešić et al., 2007; Oppong, 2014; Parkes, 2010; Smith and McNamara, 2015). For instance, this finding indicates that firms within the Nigerian O&G sector have in place health, safety, and human right policies within their organisations and project sites. This finding also supports the report published by the DPR indicating a stable drop in incident rate within the Nigerian O&G sector since 2012 (DPR, 2016).

In summary to the EFA, the researcher states that understanding the underlying relationship between the different SP practices can help organisations narrow their focus on those practices that can lead to a multiplier effect of achieving the TBL within their operations. This is necessary since SP practices are extensive and complex in nature (Delmonico et al., 2018; Mansi, 2015). The EFA findings evidently indicate that SP practices, be it social, economic or environmentally directed are fairly associated. The EFA findings also reveal that SP practices are prevalent in the Nigerian O&G sector through its high factor loadings, demonstrating a strong correlation between the 15 selected variables as revealed in the correlation matrix. Of all the variables in this research, those related to the social facet of SP seem to be more dominant in the sector, as observed in the extracted factor loadings. An interesting

observation made by using factor analysis is that all the dimensions of SP were represented in the final analysis. In addition, it is apparent from the factor loadings what the most influential attributes of SP are. As highlighted findings chapter, the underlying relationship between the variables is reflected in the factor loadings and subsequent naming. The data also indicates that these attributes are the most correlated and prevalent SP practices within the Nigerian O&G sector.

5.6 Influence of sustainability initiatives, clear SP strategy and firms' characteristics on SP implementation

By reviewing the literature, no statistical evidence was observed to suggest there is a link between clear SP strategy and the adoption of SP practices. In addition, there is a lack of theoretical evidence and mixed views on the influence of sustainability initiatives, such as ISO 14001 certification and UNGC initiative on the adoption of SP practices. To address this gap and inconsistency within the literature, this research proposed six (6) hypotheses to explore the influence of these variables on the adoption of SP practices. Specifically, this research examines the influence of the above sustainability initiatives and clear SP strategy on the adoption of social and community, economic and environmental as well as equality and safety improvements SP practices. The multiple regression analysis conducted indicates that having a clear SP strategy and sustainability initiatives can influence firms to take up social and community improvement SP practices. However, with regards to economic and environmental improvement SP practices, the results indicate that only clear SP strategy and UNGC initiatives influence adoption. The multiple regression results for equality and safety improvement SP practices, indicate that only having a clear SP strategy and ISO 14001 certification influence firms in taking up adoption.

The multiple regression results validate the need for firms' commitment to sustainability initiatives and the development of clear SP strategy. The need for clear SP strategy has been cited as a key driver of SP practices in this research, and, therefore indicate the pivotal role of having a strategic SP strategy. This empirical finding also provides statistical evidence to support assumptions - made within the extant literature - that stress the need for

developing a clear strategic path in the pursuit of sustainability. In addition, the multiple regression results show a significant relationship between this independent variable (clear SP strategy) and all the dependent variables (SCI, EEI, and ESI). For instance, the following were obtained from the analysis SCI (β=0.395, $p < 0.05$), EEI (β=0.448, $p < 0.001$) and ESI factor (β=0.306, $p < 0.01$). This, therefore, indicates that having a clear strategy is vital when implementing either social, environmental or the economic dimensions of sustainability within the procurement function. Furthermore, this statistical finding extends the SP literature, which emphasises the need for firms to have a clear SP strategy to facilitate its implementation (Brammer and Walker, 2011; McMurray, et al., 2014; Meehan and Bryde, 2011; Mena et al., 2014).

With regards to ISO 14001 certification and SP practices, the multiple regression results indicate a comparatively significant relationship. For instance, the results show that ISO 14001 certification is significantly related to SCI (β=0.816, $p < 0.001$) and ESI (β=0.359, $p < 0.05$). These results indicate that obtaining the ISO 14001 certification has a positive influence on firms towards the implementation of social, community, equality and safety improvement SP practices within the Nigerian O&G sector. These results support the findings of Curkovic and Sroufe (2011), who found that ISO 14001 certification influence the enactment of socially driven sustainable practices, such as health and safety. Surprisingly, the multiple regression results show that ISO 14001 certification, which is mainly concerned with environmental issues does not have any significant linked with the EEI interlinked SP practices (β=0.297, $p < 0.05$), although this independent variable significantly contributed to the predictive power of the regression model as shown in the R^2 figures obtained. A probable reason for this finding could be that the sampled firms got ISO 14001 certification to gain legitimacy and acceptance rather than to improve environmental performance (Jiang and Bansal, 2003). This means that certification does not directly translate into implementation unless genuine active steps are taken in this direction. Perhaps the lack of clarity – as noted within the literature – for integrating ISO 14001 requirements into operational processes can also lead to this negative result (Curkovic and Sroufe, 2011). Notwithstanding, it is arguably observed that firms occasionally obtain ISO 14001

certification as a greenwashing tactic just to improve their reputation rather than to improve their environmental performance (Prajogo et al., 2012; Vílchez, 2017). This finding is different from what this research initially anticipated based on the literature, considering that ISO 14001 certification is ideally related to the environmental dimension of SP practices. This finding is in parallel with the criticism of ISO 14001 certification in improving environmental performance. The multiple regression results, therefore, contribute to the extant literature on the possible link between ISO 14001 certification and SP practices. The results in this research indicate that there is a significant relationship between the possession of ISO 14001 certification and social and community as well as equality and safety interlinked SP practices. The link between environmental practices and social improvement as found in this research has also been observed in the literature (Islam et al., 2017a; McMurray et al., 2014).

Lastly, participation in UNGC initiative is statistically significant with SCI (β=0.134, $p < 0.01$) and EEI (β=0.097, $p < 0.001$) interlinked SP practices, but negatively related to ESI (β=-0.009) interlinked SP practices. These findings suggest that the UNGC initiatives to greater extent influence firms within the Nigerian O&G sector, to engage in SP practices. This finding is consistent with the existing literature which found that involvement in the UNGC initiative programme acts as a change driver for firms towards sustainable practices (McKinsey and Company 2004; Rasche and Waddock, 2014). The UNGC initiative mainly addresses human rights, labour conditions, environment and anti-corruption issues. Although covered in the human rights and labour conditions features of the UNGC principles, the statistical findings of this research indicate that UNGC initiative does not influence firms to implement equality and safety practices. A possible explanation for this could be due to the availability of other various initiatives applied by firms to implement SP practices. For instance, Runhaar and Lafferty (2009) found very little evidence to suggest UNGC assist firms to form sustainability strategy. However, this research found statistical evidence to suggest that participation in UNGC initiatives influence firms to engage in social and community SP practices as well as the environment and economic SP practices. This finding reflects some of the objectives of the UNGC principles, which encourages environmentally friendly approaches to business

activities (Cetindamar and Husoy, 2007). Given the relatively mixed evidence on the influence of sustainability initiatives on SP implementation as found in this research, one can only argue that signing up for sustainable programmes or acquiring certifications come with a limited impact on the firms' sustainability involvement, especially when done to satisfy external pressure to gain legitimacy. This said sustainability initiatives, e.g. ISO 14001 certification and UNGC initiative can (if applied in good faith) lead to the implementation of SP and broader sustainability practices. The need for having a clear strategic direction has been highlighted in this research which found a significant linked between clear SP strategy and the implementation of all three interlinked SP practices.

The regression analysis also found that firm size has a significant influence in the adoption of SP practices and therefore consistent with the literature on the influence of firm size in implementing innovative concepts (Hassini et al., 2012; Holt and Ghobadian, 2009). This finding suggests that the lack of capabilities and expertise for operationalising SP practices is an issue. For instances, it is arguably believed that firms of small size struggle with sustainability implementation (Yook et al., 2018). As well as having the capability to implement innovative practices, large firms are also more visible to the public and therefore likely to take up these practices – in response to institutional pressure – to improve their performances and gain legitimacy (Jiang and Bansal, 2003). Concerning *firm turnover*, the regression analysis indicates that this control variable has very little significance to the implementation of SP practices. For example, this control variable is only statistically significant with economic and environmental interlinked SP practices. Hence, firm *turnover* (massive or little) can only have a significant impact on SP practices when firms commit to sustainable practices by robustly implementing the different dimensions of SP practices.

To conclude, the multiple regression analysis provides useful insights, based on the statistical findings, on the relationship between the variables examined in this research that could effectively help in the studying and implementation of SP practices, especially as it relates to the Nigerian O&G sector. For example, this research provided positive statistically significant evidence to suggest that *clear SP strategy* does lead to the implementation of the three

interlinked SP practices (SCI, EEI and ESI), whilst ISO 14001 certification only leads to the implementation of SCI and ESI interlinked SP practices and UNGC initiatives only leads to the implementation of SCI and EEI interlinked SP practices.

5.7 Perceived impact of SP practices on firms' performances

The last objective of this research is to establish whether SP practices in the Nigerian O&G sector impacts on firms' performances. Neely et al. (1995, p. 80) described performance measure as *"a set of metrics which helps in quantifying the efficiency and/or effectiveness of an action"*. This definition suggests that in assessing the impact of SP practices all aspects, including environmental, social and economic performances should be measured. However, assessing sustainability performance can be challenging (Ahi and Searcy, 2015; Miemczyk et al., 2012; Morioka and Carvalho, 2016). From a business and management perspective, the essence of measuring is for assessing and evaluating the effectiveness of practice, action or process for achieving organisational goals. Considering that the literature is quite clear about the impacts of SP practices on environmental performances (Esfahbodi, et al., 2016; Zhu and Sarkis, 2004), this research focuses on financial and other non-financial performance measures as discussed and presented in the findings chapter.

In general, the research findings demonstrate a significant causal relationship between the implementation of SP practices and firms' performances. For example, 92% and 75% of the respondents noted that SP practices have a positive impact on the *quality of product/services* and *net profit* respectively. These findings corroborate the work of Yusuf et al. (2013) who found a significant correlation between the implementation of sustainable practices and firms' performances within the O&G sector. Comparable results are found in the sustainability literature, which suggests that the implementation of sustainability practices leads to increase financial and non-financial performances (Esfahbodi et al., 2016; Wang and Sarkis, 2013; Yook et al., 2018; Zhu and Sarkis, 2004).

A rather obvious result was recorded for SP practices on *procurement lead times* with 41% of respondents stating that SP practices have no impact, 6% declared some negative impact

while 2% recorded a very negative impact. Although 51% of respondents stated that SP practices have a positive impact, this result could likely be considered a negative influence on the growth of SP practices within the sector considering the tiny margin. The procurement function is the main focus of SP practices, for that reason, one would expect that it should have some high degree of positive impact on this function, which can then drive the course of SP down the entire organisation. A possible cause of this result is that it takes more time and resources to source sustainable products (McMurray et al., 2014; Walker and Brammer, 2009). This corroborates the qualitative findings, which indicated a lack of good infrastructure and competent local suppliers as barriers to SP practice. This finding is also in line with the findings of Yusuf et al. (2013) who found that sustainable practices do no impact on the speed of organisational processes. With respect to the impact of SP practices on *reduced costs*, 20% and 40% of the sampled population noted that it has a very positive impact and some positive impact respectively, while 24% recorded no impact and 16% negative impact as shown in Table 4.20. This could be because of different measures implemented by the firms within the sector, such as, reduction of waste and packaging materials, reduction of transportation costs as well as health and safety measures to help minimise incidents that could result in extra costs. This finding corroborates the study of Hollos et al. (2012) where sustainable practices are found to have a significant positive relationship with cost reduction.

Contrary to the findings of Yusuf et al. (2013), most of the respondents (78%) in this research noted that SP practices have positively affected the *sales and revenue* of their firms, while 16% stated no impact and 6% claimed that SP practices have some negative impact. An obvious link to this result could be the attraction of new customers while securing the loyalty of existing ones by implementing SP practices. According to the literature, SP practices can help to build good reputations and brands (Walker and Jones, 2012; Young et al. 2016), which can boost sales (Rao and Holt, 2005). In their opinion on *market share*, the result indicates that SP has a positive impact on market share. For instances, 15% recorded a very positive impact, 68% denoted some positive impact, 9% recorded no impact, 6% recorded some negative impact, while 2% documented a very negative impact. In relation to the

previous performance measure, the retention of customers and the potential to attract new ones leads to increase sales and revenue, which could hitherto attract investors leading to increased *market share* as this result shows. This find also denotes that customers and the public appreciate firms with sustainability practices. This finding is in line with the study of Dorn (1999) which found an increase in market share for those firms who implemented sustainable practices. See also bag (2012) and Yusuf et al. (2013) where a positive relationship was found between sustainable practices and market share.

The impact of SP practices on *customer loyalty* was partly addressed in the previous discussions. In addition, the research finding indicates that 37% and 51% of the sampled population affirmed very positive and some positive impact respectively on *customer loyalty* because of adopting SP practices, while 6% denoted no impact and another 6% stated that SP practices have a very negative impact on *customer loyalty*. Given the increased awareness levels of both social and environmental sustainability issues, this research reinforces the efforts made by firms in this direction and it shows that these efforts are recognised and appreciated by customers.

Table 4.20 also indicates that 35% and 51% of the population experienced a very positive impact and some positive impact respectively on *reduced risks* because of implementing SP practices. However, 2% recorded no impact, 10% some negative impact and 2% very negative impact. The literature emphasised that the implementation of best practices can reduce risk within the supply chain (Lund-Thomsen and Costa, 2011; Musa et al., 2013). Measures such as the safe operation of manufacturing and project locations and the safe handling of products within facilities adopted by firms within the sector can help reduce risks. In addition, measures that promote human rights, labour conditions and decent work can all help reduce risks. There is also a positive impact of SP adoption on *innovation* as Table 4.20 shows, with 84% of the respondents saying that their firms have experienced positively impact, while 6% recorded no impact, 4% recorded some negative impact and 6% recorded a very negative impact. This finding is in line with the literature, which suggests that sustainability measures require advanced technological innovation (Yusuf et al., 2013).

Subsequently, when asked whether SP practices influenced the *use of advanced technology*, the respondents' responses are the following: 14% recorded very positive impact, 54% recorded some positive impact, while 20% denoted no impact, 10% some negative impact and 2% very negative impact. These values validate the earlier outcome, which indicated that SP practice has a positive impact on *innovation*.

The intent of implementing best practice measures is centred on gaining a *competitive advantage*. SP practices are not different, for example, many of the exponents of SP practices observed that the need to gain a *competitive advantage* is one of the reasons firms adopt SP practices. This view is confirmed in this research, which found that the need for *competitive advantage* is a major driver of SP adoption within the Nigerian O&G sector. In this sense, firms were as to evaluate the impact of adopting SP practices on their *competitiveness*. The result shows that 20% and 61% of the sample population noted very positive and some positive impacts, respectively while 14% declared no impact, 2% some negative impact and 4% a very negative impact. This result no doubt reflect the findings obtained from the other performance metrics, which indicates the impact SP practices have on these key performance indicators, i.e. sales, revenues, reduced risks, market shares and net profits.

Furthermore, 12% of the respondents are of the view that SP practices have a very positive impact on the *flexibility of processes*, 48% said it has some positive impact, while 28% noted it has no impact, 2% noted it has some negative impact and 10% noted it has a very negative impact on the *flexibility of processes.* This result confirms the complexity involved in the implementation of sustainable practices, especially as it involves external actors like suppliers and contractors. It also suggests that the combination of environmental and social challenges together with traditional procurement challenges lead to complications within the procurement process, although such complications may normalise as implementation progresses since the benefit of SP practices is long term focus. The research findings also indicate substantial negative and no impact relationship between *procurement lead time* and SP implementation. Also, the sourcing, purchasing or production of sustainable goods

and services may take longer in comparison to non-sustainable goods and services. Lastly, Table 4.20 shows that about 55% of the respondents believe SP practices have a positive impact on their firm's *internal rate of return*. 29% stated that there is no impact, while 10% indicated that SP practices have some negative impact and 6% indicated that it has a very negative impact on their firm's *internal rate of return*. Considering that SP implementation is expensive, return on such huge investment would take a long time to manifest, and therefore be linked to the other percentage of respondents who have recorded no impact or negative impact of SP on the *internal rate of return*.

To further test the reliability and validity of the performance measures used in this research, a confirmatory factor analysis (CFA) was employed, as presented in the findings chapter. The CFA result in grouped the measurement scales into three factors, i.e. financial, efficiency and reputation. The high factor loadings obtained in the CFA confirmed the reliability of the scales and further demonstrates a significant relationship between SP practices and market share, SP practices and sales and revenue, and SP practices and technology. These findings, suggest that the implementation of SP practices can result in higher market share, increase sales and technological advancement. These findings support assumptions made in the literature which indicates that firms gain acceptance and legitimacy from the public through the implementation of sustainable practices (Jiang and Bansal, 2003).

The findings of a positive relationship between the implementation of SP practices and performances, could reduce barriers such as *limited benefits*, and enhance the implementation of SP practices within the Nigerian O&G sector. The research findings present a strong business case for SP practices since it found that SP does have a positive impact on firms' performances. However, the benefits of implementing SP practices are better gained using the TBL approach. This assumption is supported by Wang and Sarkis (2013) who found an insignificant relationship between the implementation of the social or environmental dimension of sustainable practices and firms' financial performance but found that the implementation of both social and environmental practices can lead to improved financial performance.

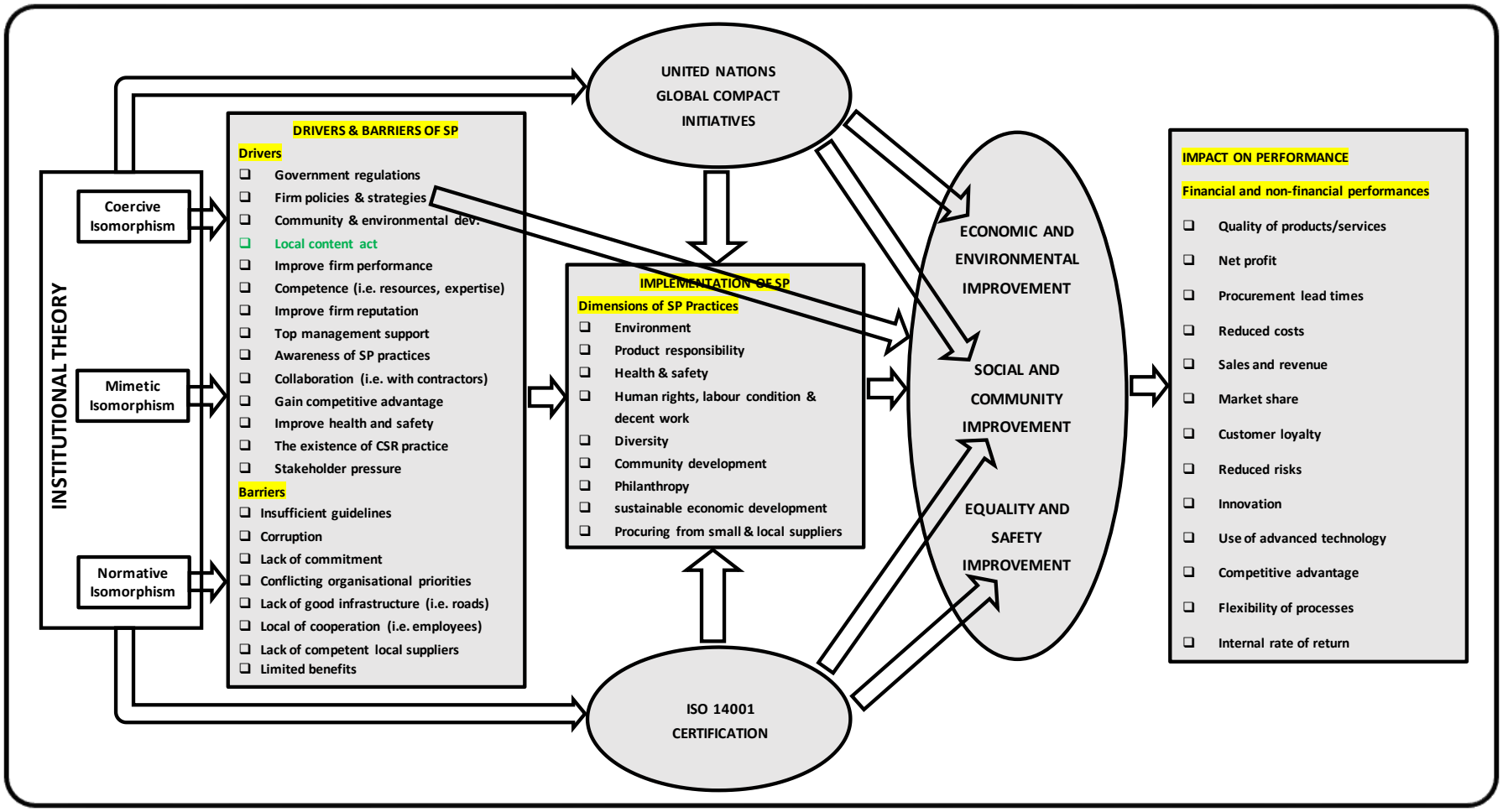

Figure 5.1: Revised SP conceptual framework
Source: Author

Drawing on the discussions presented in this chapter, the applicability of the institutional theory proposed and presented in chapter two of this thesis is thus valid. The institutional theory is broadly applicable in this research, which confirmed the relationship between the variables examined in this research as depicted in the revised conceptual framework (Figure 5.1). Figure 5.1. with the aid of the arrows demonstrate the link between clear SP strategy, sustainability initiatives and the three interlinked SP practices examined. For example, it shows that having a clear SP strategy is significantly linked with all three interlinked SP practices. However, with regards to the sustainability initiatives studied, it shows that ISO 14001 certification is only significantly related to social and community improvement and equality and safety improvement interlinked SP practices, whilst the UNGC initiative is only significantly related to social and community improvement and economic and environmental improvement interlinked SP practices. This research, in line with the existing literature, also found government regulations and policies as the main driver for implementing SP practices. The local content act, highlighted in *'green'* for ease of reference, is the only new driver found in this research. The discussions above present, in comparison to the existing literature, key findings and contributions of this research to SP practices literature.

5.8 Summary

The aim of this chapter is to highlight and discussed, in relation to the literature, the relevant key findings of this research. However, to commence the chapter, the researcher reproduced the research gaps which instigated this research to ensure consistency in the research process and structure. Interestingly, this research provides new insights that can help practitioners, policymakers and researchers within this field. The meaning and extent of engaging in SP practices within the Nigerian O&G sector are discussed extensively. This chapter also presents relevant discussions on the drivers and barriers of SP practices within the sector of study, noting that the most prevalent driver and barrier to SP practices within the Nigerian O&G sector are *government regulations and policies*.

The EFA, which is one of the main theoretical contributions of this research is also discussed extensively. The EFA led to the extraction of 3 Factors that were correspondingly labelled on the basis of their factor loadings in the findings chapter. The findings demonstrate that SP practices are significantly correlated. Assumptions made as a result of the EFA results are discussed while attempting to provide theoretical links where possible. In addition, the multiple regression results which relate to the influence of *clear SP strategy, sustainability initiatives (I.e. ISO 14001 certification and UNGC initiative)* on the implementation of the three interlinked SP practices are also discussed. Discussion about the influence of firms' characteristics is also presented. To conclude the discussion of findings, the perceived impact of SP practices on firms' performance is discussed with a relevant link to the existing literature.

CHAPTER SIX: CONCLUSION

6.1 Introduction

This chapter of the thesis presents a summary of the work carried out in the investigation of sustainable procurement (SP) practices within the Nigerian O&G sector and highlights the key research findings, contributions, managerial implications, research recommendations, research limitations, and areas for future research.

6.2 A brief synopsis of the thesis

This study set out to investigate SP practices within the Nigerian O&G sector in order to gain a better understanding of the practices in the region. To achieve its aim, this research adopted a robust approach by first understanding the meaning of SP practices from the Nigerian O&G sector perspective, before moving on to determine the underlying dimensions of SP practices, the drivers and barriers of SP practices and examining the relationship among SP practices, performances, procurement sustainability strategy and initiatives as shown in the research objectives presented in chapter one and reproduced hereunder for reference purposes.

- ***OBJ1:*** To identify the current state, drivers, and barriers of SP practices in the Nigerian O&G sector.
- ***OBJ2:*** To explore the underlying relationships among SP practices in the Nigerian O&G sector by grouping them into factors.
- ***OBJ3:*** To examine whether sustainability initiatives, such as ISO 14001 certification and UNGC initiative drives firms to adopt SP practices.
- ***OBJ4:*** To ascertain whether having clear SP strategy drives firms to adopt SP practices.
- ***OBJ5:*** To study whether firms' corporate characteristics (size, turnover and time of applying SP), have an influence on the adoption of SP practices.
- ***OBJ6:*** To establish whether SP practices in the Nigerian O&G sector impact on firms' performances.

To achieve the above objectives, the strategic importance of the procurement function and its role in enhancing the overall sustainability performances of firms as documented within the literature was examined (Crespin-Mazet and Dontenwill, 2012). This was necessary to gain valid knowledge on the business case for sustainable practices, especially as this research seeks to examine the impact of SP practices on firms' performances. Following review of the extant SP literature, it was also determined that SP practices are encapsulated in nine different dimensions, e.g. *'environment', 'diversity', 'human rights', 'safety', 'philanthropy', 'procuring from small and local suppliers', 'community development', 'product responsibility' and 'sustainable economic development'* which consist of the three pillars of sustainability - TBL. However, researchers adopt these dimensions according to the scope of their research. For instance, not all dimensions are adopted or examined by authors in the field. In this study, these dimensions were examined and validated as presented in the research findings.

It is also clear from the literature review that SP practices have been voluntary as firms are reluctant to implement them, making the influence of internal and external factors crucial to implementation as presented in the drivers and barriers to SP practices. This is also valid within the context of the study, where there is less regulatory framework governing activities, in comparison to developed countries. Essentially, there is a lack of implementation guidelines as well as studies that evaluate SP practices within the Nigerian O&G sector. This situation is alarming considering SP practices are proposed to mitigate against environmental, societal and economic challenges - key areas where the Nigerian O&G sector is accused of failing in its responsibilities (Idowu and Lambo, 2018; Kadafa, 2012; Nwapi, 2015). Notwithstanding, from the literature review, elements of sustainable practices, e.g. provision of basic amenities to communities, provision of training and award of scholarships to individuals, were observed within the sector, suggesting that firms within the sector undertake some sustainable practices.

In line with the conceptual framework of SP practices, this research relied on the institutional theory. The institutional theory is one of the most commonly applied theories

within the sustainability literature, which emphasise the role of institutional drivers, through coercive, mimetic and normative pressures (Carter and Easton, 2011; Grob and Benn, 2014; Touboulic and Walker, 2015). The theory is considered the most appropriate theory suitable for the implementation and investigation of SP practices in the context of the study.

6.3 Achievement of research objectives

The six (6) research objectives were achieved - through the empirical data collected from experience procurement professionals within the Nigerian O&G sector - and analysed in this research, using appropriate methods and tools as presented in this research. For example, to achieve ***OBJ1*** empirical data were collected to confirm, disconfirm or provide new insights on the dimensions, drivers and barriers of SP practices from the perspective of the Nigerian O&G sector. Secondly, the underlying relationships between SP practices were explored using exploratory factor analysis (EFA) by grouping the summary SP practices into three Factors ***(OBJ2)***. To achieve ***OBJ3, OBJ4*** and ***OBJ5*** hierarchical multiple regression models were developed to ascertain the relationship between sustainability initiatives (i.e. ISO 14001 certification and UNGC initiative), clear SP strategy and SP practices as contained in the hypotheses generated in this research. The multiple regression analysis also examined the effect of organisational characteristics on SP implementation. Lastly, a descriptive cross-tabulation of firms' performance measures was presented and validated with confirmatory factor analysis (CFA) to achieve ***OBJ6***.

6.4 Key research findings

Consistent with the objectives, this research seeks to answer seven (7) specific questions and test six (6) hypotheses, which form the key findings of this research as presented in Table 6.1. To the best of the researcher's knowledge, this research is the first to investigate the adoption and implementation of SP practices within the Nigerian O&G sector. The empirical data collected in this research suggest that SP practices are prevalent within the sector with the environmental dimension considered highly important and implemented in comparison to the other dimensions. Furthermore, the empirical data confirmed the drivers and barriers of SP practices as presented in the existing literature and also found a new driver *(local*

content Act), which is quite insightful. In exploring the underlying relationships between SP practices, this research found that both economic and environmental dimensions of SP practices are highly related, social and community development dimensions of SP practices are highly related, and diversity and health and safety dimension of SP practices are also highly related. For example, *'policy to improve living conditions and the economic', 'policy to enhance transparency', 'ensures suppliers abide by all minimum standards and laws', 'purchase environmental-friendly products from MWBE', 'policy on ethical practices' and 'checks and prevents pollution'* – comprising of both economic and environmental dimensions – all loaded into one factor.

The empirical results also found statistically significant evidence which suggests that having a *clear SP strategy* impacts the implementation of the three interlinked SP practices. In contrast, the research found that UNGC initiative is only statistically significant with two interlinked SP practices *(SCI* and *EEI)* and ISO 14001 certification is only statistically significant with two interlinked SP practices *(SCI* and *ESI)*. Hence, these findings suggest that both external and internal factors impact the implementation of SP practices. Furthermore, with a highly significant relationship of *SCI* (β=0.395, $p < 0.05$), *EEI* (β=0.448, $p < 0.001$) and *ESI* (β=0.306, $p < 0.01$) the findings emphasised on the need to have a *clear SP strategy*. With regards to the impact of SP practices on firms' perceived performances, this research found that SP implementation leads to improved product quality, increased sales, increased profit, and customer loyalty amongst others. This finding, therefore, indicates that SP practices lead to improved financial performance. Consequently, the *win-win* situation for adopters who invest in SP practices is confirmed in this research.

Given the above discussions, it is evident that the research questions and hypotheses which seek to gain an understanding of SP practices, identify key drivers and barriers to SP practices, explore the underlying relationships between SP practices, ascertain the impact of *clear SP strategy*, and sustainability initiatives on SP practices within the Nigerian O&G sector has been appropriately answered. Considering the sampling technique used and the stance of this research – the upstream is the leader of the Nigerian O&G sector – the

research findings are generalised to the Nigerian O&G sector considered as the research population from which the sampled firms were drawn.

Table 6.1: Key research findings

Research questions	Findings
RQ1: What is the nature and extent of SP dimensions within the Nigerian O&G sector?	This research confirmed the implementation of the different dimensions of SP practices across the Nigerian O&G sector. The environment dimension found to be dominant
RQ2: How important are SP dimensions to firms within the Nigerian O&G sector?	The environment dimension is also found to be the most important aspect of SP practices to firms across the Nigerian O&G sector
RQ3: What are the drivers and barriers associated with the adoption of SP practices within the Nigerian O&G sector?	This research confirmed the drivers and barriers to SP practices as covered in the existing literature. New insights were also gained in this research which found *"local content Act"* as a key driver.
RQ4: What are the underlying relationships among the SP practices explored in this research?	The EFA found statistically significant evidence to suggest that SP practices are correlated. For example, the EFA grouped the SP practices into three (3) factors, consisting of *social and community improvement (SCI)*, *economic and environmental improvement (EEI)* and *equality and safety improvement (ESI)*, SP practices.
RQ5: What are the relationships among adopted SP practices and sustainability initiatives, i.e. ISO 14001 certification and UN Global Compact?	The multiple regression analysis only found statistically significant evidence to suggest that: (i) *ISO 14001 certification* influence the implementation of *SCI* and *ESI* interlinked SP practices, (ii) *UNGC initiative* influence the implementation of *SCI* and *EEI* interlinked SP practices. (Partial relationship with SP practices)
RQ6: What are the relationships among adopted SP practices and SP strategy?	The multiple regression analysis found statistically significant evidence to suggest that *clear SP strategy* influence the implementation of SP practices.
RQ7: Do the adoption and implementation of SP practices within the Nigerian O&G sector improve practising firms' performances?	The research found statistically significant evidence to suggest that firms' performances improve as a result of implementing SP practices.

Source: Author

6.5 Research contributions

In view of the approaches used in this research, the contributions of this research are in multiple folds. For example, this research has made theoretical contributions by utilising and validating the established SP scales especially from the O&G sector and developing country perspective. This research has also made empirical contributions through the collection of primary data from experienced professionals within the field. Further discussion of the research contributions is presented below.

6.5.1 Theoretical and practical contributions

The existing SP literature focused on developed countries and mainly examined the opportunities, challenges, drivers and barriers to SP practices. For example, existing studies on SP practices are mainly from the UK, Europe, and USA context, with very few from the rest of the world, especially Nigeria (Brammer and Walker, 2011; Delmonico et al., 2018; Oyewobi et al., 2017; Roman, 2017). SP adoption has also been examined from the organisational perspective, such as leadership, commitment and skills (Grandia et al., 2013; Walker and Brammer, 2009). This demonstrates the lack of empirical and theoretical studies that explicitly examine SP practices from the Nigerian O&G sector, especially the influence of sustainability initiatives (i.e. ISO 14001 certification and UNGC initiative) on the adoption of broader SP practices.

The main theoretical contributions of this research are the collective findings of this research, which offers the foundation upon which researchers could build on in the future. This research is the first of its kind to: determine the dimensions of SP practices, explore the underlying relationships between SP practices, examine the effect of ISO 14001 certification, UNGC initiative on SP practices, and ascertain whether clear SP strategy influence the implementation of SP practices using empirical data from the O&G sector of developing country. This research also contributes to theory by using statistical data to confirm the impacts of SP practices on firms' performance. Specifically, this research confirmed the dimensions of SP practices using the Nigerian O&G sector as a proxy. This is necessary,

considering the inconsistency within the literature regarding the dimensions of SP practices and application of measurement scale to assess these dimensions (Islam et al., 2017b; Mansi, 2015; Meehan and Bryde, 2015; Oyewobi et al., 2017; Ruparathna and Hewage, 2015; Sourani, 2008; Walker and Brammer, 2009). Considering the wider implications of sustainability challenges, this present research applied and tested the dimensions of SP practices proposed by Mansi (2015) and found that these dimensions are valid and reflect broader sustainability challenges, especially within the Nigerian O&G gas sector. This finding provides a theoretical contribution in the sense that it empirically validated the dimensions of SP practices that practitioners and researchers should consider when implementing and measuring SP practices. The validation of these dimensions also suggests that the PSR scale developed by Carter and Jennings (2004) as well as those added by Walker and Brammer (2009) might need further updating to reflect imminent sustainability challenges. In practice, this finding means managers and procurement professionals have at their disposal comprehensive valid SP practices that they can implement in response to their sustainability challenges. However, caution must be applied when implementing these practices, especially in industries where it has not been tested.

The research findings regarding the underlying relationships among SP practices is novel and contributes to the existing SP literature, which has before now remained unaware of the linked between economic and environmental driven practices, social and community driven practices and equality and safety driven practices. For example, the EFA found that there is a significant link among these practices and that the adoption of environmental SP practices to lead both environmental and economic improvements, whilst the adoption of social SP practices can lead social and community improvements. The same result was found concerning equality SP practices which can lead to both equality and safety improvements. What this means in theory and in practice is that firms can concentrate on environmental SP practices and achieve environmental and economic performances or concentrate on economic SP practices and achievement economic and environmental performances.

Whereas other key drivers of SP practices have been examined against its adoption and implementation, no research has explicitly examined the influence of sustainability initiatives (i.e. ISO 14001 certification and UNGC initiative) on SP adoption. This is despite the growing attention and debate these initiatives and other drivers of SP practices are receiving within the sustainability field. Similarly, research which explicitly examined the relationship between having a clear SP strategy on SP adoption are scarce. This research took a proactive step in this direction, relying on institutional theory, and found that coercive, mimetic and normative pressures from sustainability initiatives and having a clear SP strategy result in the adoption and subsequent implementation of SP practices that can ultimately lead to social and community improvement, economic and environmental improvement as well as equality and safety improvement. The statistical findings regarding the influence of ISO 14001 certification, UNGC initiative, and clear SP strategy on SP practices from the Nigerian O&G sector perspective, as found in this research, provides clear theoretical insights on the driving forces of SP adoption. Although these initiatives have been debated within the literature, this present research provided statistical evidence that goes beyond mere identification of these variables as crucial to the implementation of SP practices, especially within the context of the study. It is, therefore, argued that this research is one of the few studies that have been able to provide statistical evidence on the *driver - implementation* relationship between the observed variables. Procurement professionals and policy-makers might want to exploit the sustainability initiative variables examined in this research by way of concretely getting involved in the programmes.

The relationship between the summary SP practices found in this research provides useful insights that can be tested or evaluated further in the future since it is a new discovery within the SP literature. Researchers could examine from a different context how effective these interlinked SP practices are in achieving the core objectives (improving environmental, economic and social performance) of SP practices. This finding provides a theoretical contribution by reducing and classifying – using EFA – the SP practices into three (3) different factors as found in this research. Hence it could be argued that the variables extracted in this

research represent the practices needed to operationalise SP within the Nigerian O&G sector.

From the empirical evidence found, this research also extends the theoretical assumptions that institutional pressures (be it coercive, mimetic or normative) drive firms to adopt SP practices that can lead to improved firms' performances. Considering the limited investigation within the context of the study and mixed perception observed within the literature on SP practices and performance assessment, the findings of this present research is of theoretical significance and contributes to the existing SP literature. This research extends knowledge on SP implementation and subsequent outcomes, by highlighting the key drivers and barriers to SP practices, grouping the observed SP practices in three (3) factors, and providing empirical evidence which indicates that SP practices do lead to improved financial performances within the Nigerian O&G sector.

6.5.2 Empirical contributions

Although considered a new concept, SP practices have received considerable attention especially from manufacturing and developed countries (Chen et al., 2017; Walker, 2013). Recent studies on SP practices also focused mainly on developed countries but within the public sector domain. Furthermore, none of these studies has attempted to explore the underlying relationships between SP practices. This present research investigates SP practices from a developing country perspective, which is underreached. In particular, the research investigates SP practices within the O&G sector of Nigeria, a developing country within the continent of Africa.

Although, known for its contribution to petroleum product production, Nigeria as a country show little concern to sustainability challenges (Amaeshi et al., 2006; Idowu and Lambo, 2018; Ite, 2007; Kadafa, 2012; Nwapi, 2015; Oyewobi et al., 2017). This situation ultimately led to low implementation and study of sustainability practices within the Nigerian O&G sector. In essence, there is little evidence to suggest that SP practices within the Nigerian O&G sector have been investigated. Although it is understandably noted that SP practices

are a new dimension to the pursuit for sustainability, this should not deter its development especially within the context of the study, where environmental and societal issues are of great concerns. The literature review conducted signpost that there is no study (empirical, conceptual or otherwise) that has specifically examined the adoption or implementation of SP practices within the Nigerian O&G sector. This, therefore, validates the empirical significance of this present research to the SP literature. This research is one of the first to report on the implementation and impact of SP practices within the Nigerian O&G sector. In addition to extending the SP literature, this research also provides a platform for future research on SP practices.

6.6 Managerial implications

Sustainability as a concept has gained unprecedented attention around the world, as firms in all sizes push to integrate sustainability measures into their operations. This move as argued within the literature and confirmed in this research would improve organisational performances and help firms gain a competitive advantage (Yusuf et al., 2013). Hence it is encouraged that firms aiming to be sustainable should consider the adoption of SP practices, to reduce the impacts of their activities and that of their suppliers, consumers and relevant partners within their supply chains (Giunipero et al., 2012; Hollos et al., 2012; McMurray et al., 2014). The adoption and implementation of SP practices are evident in the findings of this research, although the findings open up some implications.

Some practical implications can be assumed as a result of the research findings. For instance, the highest driver for implementing SP practices found in this research is *government regulations and policies*. A possible implication of this finding is that managers who respond more to external pressure do that to gain legitimacy and acceptance and not to truly improve organisational processes. This suggests that relying on external driving forces like *government regulations and policies* may not be sustainable in the long term. Managers should, therefore, accept their responsibility and accordingly implement practical sustainability measures instead of the *'greenwashing'* approach adopted by some. Hence, policymakers should provide an enabling environment through the provision of appropriate

frameworks, awareness programmes and incentives that can be instrumental to the implementation of SP practices across the O&G sector. To operationalise SP practices this research also stressed the need for managers to develop a *clear SP strategy* that can help stimulate these practices across the procurement process.

The exploration of three (3) interlinked SP practices which represent comprehensive SP practices, although essentially relevant in this research context where financial constraint is evident, practitioners are advised to carry out a detailed assessment and evaluation of the interlinked SP practices found in this research against their overall sustainability goals to ensure these practices can mitigate their sustainability challenges. However, statistical findings of this research indicate that the implementation of the three (3) interlinked SP practices could also lead to sustainability. Whereas this research found empirical evidence which suggests that SP practices lead to improved financial and non-financial performances, an implication to this finding is that the performance measure of SP practices does not reflect exact figures from sales, investments or earnings gained as a result of implementing SP practices. Therefore, care must be taken in the interpretation of this finding.

6.7 Research recommendations

Based on the research findings, the following recommendations are presented:

1) Policymakers within the Nigerian O&G sector should provide a policy framework that can help firms operationalise SP practices.
2) Policymakers within the Nigerian O&G sector should as a matter of necessity – considering the findings of this research and sustainability challenges facing the nation – enact policy to compel firms to include elements of sustainability in all operational and transactional processes.
3) Policymakers within the Nigerian O&G sector should embark on awareness and training programmes, through mass media, seminars and conferences to promote the implementation of SP practices.
4) Firms are advised to get involved in sustainability initiatives in order to improve their knowledge on how best to implement SP practices and other sustainability practices.

5) Firms should develop a clear SP strategy by identifying the business needs for sustainability, set organisational sustainability targets, appoint sustainability officers and provide clear direction that can aid SP implementation.
6) Firms should show commitment by investing in training, capacity building, providing incentives (e.g. awards to personnel) as well as monitoring and evaluating the process

6.8 Research limitations

Limitations are bound in research studies, especially those with quantitative paradigm (Brammer and Walker, 2011; Jiang and Bansal, 2003; Zhu and Sarkis, 2004). An obvious limitation of this research is that it investigates SP practices by observing only one sector in Nigeria, which limits its generalisation to the Nigerian O&G sector alone. The findings of this research are therefore not a depiction of the entire country of study, notwithstanding universal. The conceptual framework of this research is in line with the existing SP literature, which suggests the implementation of SP practices is based on key factors acting as enablers (drivers), whilst factors deterring its implementation are class as barriers. It is, therefore, based on the literature review the summary model of SP barriers and drivers (Figure 2.3), the conceptual framework (Figure 2.4), and hypotheses model (Figure 2.5) were developed. However, Figure 2.3 of the SP barriers and drivers may not actually reflect those drivers and barriers not frequently cited in the literature and those found in this research.

Furthermore, although statistical tests indicate adequate sample size and the analysis suggest statistically significant and non-significant findings, the small sample size of this research may have impacted on the research findings. Note, that the maximum number of responses that could have been received is 118 (valid numbers of upstream O&G firms at the time of data collection) and as a result, this constitutes a compromise in terms of sample size. Future research could utilise a larger sample size by including the downstream sector in assessing the moderating effect of relationships between the variables observed in this research. While the data collection instrument utilised in this research went through rigorous editing and vetting by professionals and researchers, the research recognises the

drawbacks associated with online questionnaire surveys. Since this research utilised a deductive approach and quantitative survey strategy, future work could adopt a mixed method approach where the emphasis on the reasons and approaches to implementing SP practices could be explored further.

With regards to the data collection techniques, steps were taken in this research to reduce bias, for example, this research combined an already utilised SP scale in measuring SP practices. However, the self-administered questionnaire technique used is open to criticism because the quality and correctness of data collected cannot be guaranteed. For instance, it is assumed that only respondents with the knowledge of SP practices who have also implemented SP practices would complete the questionnaire. Nevertheless, this technique has remained a dominant data collection technique, and widely used by renowned academia within the field of business and management (Grandia, 2016; Roman, 2017; Walker and Brammer, 2009; Yusuf et al., 2013; Zhu and Sarkis, 2004). Future research may consider mixed or triangulation methods to enhance the quality of data collection, this way the robustness of research findings can be maintained.

The research findings confirm the awareness and implementation level of SP practices to be high, yet it appears that these efforts are not visible, as stakeholders within the sector continue to criticise the failings of the Nigerian O&G sector to address sustainability issues. Whereas the literature argues that the benefits of SP practices are not realised within short periods, one cannot rule out the possibility of *greenwashing* by the sample firms, who may want to appear perfect with a view of gaining public acceptance. As long as this research considers data from a single data collection method (questionnaire), triangulation can be used to mitigate this variation in research findings by drawing a reasonable conclusion from the various data sources.

Although this research found a positive relationship between the implementation of SP practices and firms' financial and non-financial performances, this finding is based on the perceived impacts reported by the sample firms, which is not statistically verified. Hence it

can be argued that respondents overestimated the impact of SP practices to gain social desirability. Furthermore, it is not within the purview of this research to assess the social and environmental performance of firms, especially since there is a consensus within the literature that SP practices have positive impact on firms' environmental performance (Islam et al., 2017a; Yook et al., 2018; Zhu and Sarkis, 2004), and that firms adopt sustainable practices to gain legitimacy and acceptance. In addition, measuring social performance is challenging in comparison to economic and environmental performance due to lack of clear measurement metrics (Miemczyk et al., 2012; Morioka and Carvalho, 2016). Hence, this research focus on the financial and non-financial performance of firms.

6.9 Future research

As already hinted there are several opportunities for future research following insights gained in this research. First, as this research focused on the O&G sector, future research may want to broaden the scope by extending the work to include other key sectors of the Nigerian economy, e.g. manufacturing, finance, telecom and agriculture. In addition, future research studies could consider adopting a mixed or triangulation method which provides the opportunity of utilising interviewing strategy where questions to understand the meanings attached to relevant concepts of SP practices can be asked. Second, future research could look at undertaking a comparative study of SP practices within O&G sectors from different regions and to test for the possible influence of antecedents on SP implementation.

Third, since this research focused on the Nigerian O&G sector, future research could test the applicability of the regression model to other sectors within Nigeria using empirical data or generate a new model using other key drivers of SP practices, such as *top management commitment* and *supplier collaboration*. Fourth, future research may also consider the impact of SP practices on all three dimensions of sustainability, since this present research only consider the financial and non-financial performance of firms. Lastly, future research is needed to compare the drivers and barriers found in this against other sectors in the Nigerian context.

6.10 Summary

To conclude, the researcher argues that the objectives of this research were accordingly achieved, through the rigorous approach used in investigating the research phenomenon within the Nigerian O&G sector, which determined the dimensions of SP practices through the literature review conducted, identified the current state, drivers and barriers of SP practices based on the empirical data, explored the underlying relationship between SP practice using EFA to group them into three (3) factors, examined the influence of sustainability initiatives and clear SP strategy on the adoption of SP practices. It also investigated the impact of firms' characteristics on the adoption of SP practices before assessing the impact of SP practices on firms' perceived performances.

This chapter has provided a summary of the research undertaken in this thesis. It started by highlighting the research gaps and objectives as presented and discussed in chapter one of this thesis. Is also highlights the key research findings, research contributions, research recommendations, managerial implications, research limitations and possible future research directions. In specific, this chapter attempts to summarise the findings of this research in Table 6.1, providing additional inferences on what the findings could mean in both theory and practice. The main research contributions were also presented and discussed highlighting their significance to the existing body of SP literature.

The research findings suggest that policymakers and senior management employees within the Nigerian O&G sector should provide both policy structure and support for implementing SP practices across the sector as outlined in the recommendation section. Whereas, the study claim generalisation to the Nigerian O&G sector, caution must be applied, as the findings might not be fully supported considering the small sample size.

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APPENDIX 1

SP dimensions	*Practices*
Environment	***Environmental*** *(Carter and Jennings, 2004; Mansi, 2015)* ▪ Adopt a policy to recycle, reuse and disassemble products ▪ Adopt a policy to reduce waste and packaging material ▪ Adopt a policy to promote environmental responsibility ▪ Adopt a life cycle analysis (whole life costing approach) of products ▪ Purchase products and services that are environment-friendly ▪ Adopt a policy to use efficient and/or green energy ▪ Be ISO 14001 certified ▪ Adopt environmental management systems ▪ Have procedures for checking and preventing pollution ***Product responsibility*** *(Mansi, 2015)* ▪ Adopt a policy to purchase recycled-content products ▪ Selects products with environmental attributes that minimise the environmental impact ▪ Adopt policy which systematically integrates environmental and social considerations into all production activities ▪ Ensure that suppliers abide by all minimum standards and laws ▪ Adopt a policy to evaluate the environmental friendliness of the production process ▪ Adopt a policy for suppliers to design, manufacture, produce and distribute products that reduce the use of energy ▪ Adopt a policy on reducing transportation costs ▪ Adopt a policy on cleaner production ▪ Adopt a policy to evaluate suppliers' environmental performance
	Health and safety *(Carter and Jennings, 2004; Mansi, 2015)* ▪ Ensure that manufacturing locations are operated in a safe manner ▪ Ensure safe incoming movement of product to facilities ▪ Ensuring occupational health and safety of workers ▪ Review periodically the health and safety measures at construction sites and of suppliers ▪ Be OHSAS-18001 (Occupational health and safety management systems) certified

Social	***Procuring from small and local suppliers*** *(Walker and Brammer, 2009)* ***Human rights, labour conditions and decent work*** *(Carter and Jennings, 2004; Mansi, 2015)* ▪ Adopt a policy on promoting human rights and labour conditions ▪ Adopt a policy on non-discrimination and child labour ▪ Adopt a policy on 'living wage' greater than a country's or region's minimum wage ▪ Adopt a policy to comply with ILO standards ▪ Participate in UN's Global compact programme ▪ Have effective redress of grievances system ▪ Adopt a policy on equality, where every employee, without discrimination, has the right to equal pay for equal work ▪ Adopt a policy for workers with disabilities ▪ Provide training on human rights policies or procedures concerning aspects of human rights relevant to operations ***Diversity*** *(Carter and Jennings, 2004; Mansi, 2015)* ▪ Purchase products and services from minority/women-owned business enterprise (MWBE) ▪ Have awareness programs to ensure diversity practices ▪ Have diversity program to encourage suppliers to work with minority, smaller business, and women-owned business to empower diverse communities ▪ Support associations and programs that strengthen diversity ▪ Adopt a policy to respect the diversity and differences of their employees to promote a comfortable and safe work environment ***Community development*** *(Carter and Jennings, 2004; Mansi, 2015; Walker and Brammer, 2009)* ▪ Adopt a policy on wellbeing and welfare of the society ▪ Adopt a policy to provide education and training for the social development of communities ▪ Adopt a policy to improve the living conditions of communities and manufacturing units spread across its manufacturing plants

	▪ Engage in social activities to support social-economic and community development ▪ Adopt a policy on health and hygiene on its manufacturing plants ▪ Organise medical check-up camps for workers at its operating sites ▪ Have anti-corruption policies ▪ Adopt a policy to recruit local and minority people ▪ Adopt a policy to source from small and local suppliers to provide economic benefit to the community ***Philanthropy*** *(Carter and Jennings, 2004; Mansi, 2015)* ▪ Volunteers at local charities ▪ Donates to philanthropic organisations ▪ Adopt a policy to donate at local communities to enhance the wellbeing of local people ▪ Encourage suppliers to participate in philanthropy activities
Economic	***Economic development*** *(Carter and Jennings, 2004; Mansi, 2015)* ▪ Adopt a policy on fair trade practices ▪ Adopt a policy on ethical practices ▪ Adopt a policy to enhance transparency measures ▪ Adopt a policy to encourage innovation ▪ Adopt a policy to ensure sustainable economic development in the area where the manufacturing and operations unit is located ▪ Adopt a policy to provide infrastructure development (services)

APPENDIX 2

Survey questionnaires

Part A: General information

Name of firm:……

Location of firm:……

Respondent's position:……

Approximate number of employees: 1 – 50 ◯ 51 – 200 ◯ 201 – 500 ◯ 501 and above ◯

Firm's yearly turnover: <$5m ◯ $5m - $20m ◯ $21m - $50m ◯ $51m - $100m ◯ >$100 ◯

Business sector:
(i) Oil & Gas Operator ◯
(ii) Oil & Gas Servicing Firm ◯
(iii) Oil & Gas Logistics & Transport ◯
(iv) Exploration and Production ◯
(v) Oil & Gas Consultancy ◯
(vi) Marine Engineering & Construction ◯
(vi) Other, please specify:……

Part B: Sustainable procurement practices

1) Do you know or understand the term sustainable procurement? Yes ◯ No ◯

If yes, what does the term sustainable procurement mean to you?

……

……

2) Does your firm adopt sustainable procurement as a practice? Yes ◯ No ◯

3) If No, would you consider adopting and implementing sustainable procurement in the future?

Definitely Yes 5	Maybe Yes 4	Not Sure 3	Maybe Not 2	Definitely No 1

4) For how long has your firm adopted sustainable procurement practices?

1 – 5yrs ◯ 6 – 10yrs ◯ 11 – 15yrs ◯ 16 – 20yrs ◯ 21yrs and above ◯

5) Is there a clear directive for your firm to adopt sustainable procurement practices? Yes ◯ No ◯

6) Does your firm have a clear sustainable procurement policy or strategy?

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

7) Do your firm's sustainable procurement practices benefit from top level support? Yes ◯ No ◯

8) Is your firm ISO 14001 accredited?

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

9) Kindly indicate by ticking the sustainable procurement dimensions that your firm has adopted

Environment ○

Diversity ○

Human rights ○

Safety ○

Philanthropy ○

Procuring from small and local suppliers ○

Community development ○

Product responsibility ○

Sustainable economic development ○

Others, please specify……..

10) Please indicate by ticking, the importance of the above adopted dimensions to your firm

	Very Important 5	Important 4	Not Sure 3	Somehow Important 2	Not Important 1
Environment					
Diversity					
Human Rights					
Safety					
Philanthropy					
Procuring from small and local suppliers					
Community development					
Product responsibility					
Sustainable economic development					
Others, please specify…					

11) Kindly indicate by ticking the sustainable procurement dimensions that your firm plans to adopt?

Environment ○

Diversity ○

Human rights ○

Safety ○

Philanthropy ○

Procuring from small and local suppliers ○

Community development ○

Product responsibility ○

Sustainable economic development ○

Others, please specify……..

12) What would you consider to be the major drivers of sustainable procurement within the Nigerian O&G sector? Please list.

13) What would you consider to be the major barriers of sustainable procurement within the Nigerian O&G sector? Please list.

Environmental

14) Your firm has a policy to recycle, reuse and disassemble products

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

15) Your firm has a policy to reduce waste and packaging material

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

16) Your firm has a policy to promote environmental responsibility

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

17) Your firm adopts a life cycle analysis (whole life costing approach) of products

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

18) Your firm purchases products or services that are environmentally friendly

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

19) Your firm has a policy to use efficient or green energy

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

20) Your firm adopts environmental management systems

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

21) Your firm has procedures for checking and preventing pollution

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

Product responsibility

22) Your firm has a policy to purchase recycled-content products

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

23) Your firm selects products with environmental attributes that minimise the environmental impact

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

24) Your firm has a policy that systematically integrates environmental and social considerations into all procurement activities

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

25) Your firm ensures that suppliers abide by all minimum standards and laws

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

26) Your firm has adopted policies to evaluate the environmental friendliness of the procurement and production process

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

27) Your firm has a policy for suppliers to design, manufacture, produce and distribute products that reduce the use of energy

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

28) Your firm has a policy on reducing transportation costs

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

29) Your firm has a policy on cleaner production

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

30) Your firm has a policy to evaluate suppliers' environmental performances

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

Health and safety

31) Your firm ensures that manufacturing or project locations are operated in a safe manner

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

32) Your firm ensures safe incoming movement of products to facilities

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

33) Your firm has a policy of ensuring occupational health and safety of workers

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

34) Your firm reviews periodically the health and safety measures at project sites and of suppliers

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

35) Is your firm OHSAS-18001 (occupational health and safety management systems) certified?

Yes 2	No 1

Human rights, labour conditions and decent work

36) Your firm has a policy on promoting human rights and labour conditions

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

37) Your firm has a policy on non-discrimination and child labour

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

38) Your firm has a policy on 'living wage' greater than a country's or region's minimum wage

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

39) Your firm has a policy to comply with International Labour Organisation (ILO) standards

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

40) Your firm has effective redress of grievances system

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

41) Your firm has a policy on equality, where every employee, without discrimination, has the right to equal pay for equal work

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

42) Your firm has a policy for workers with disabilities

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

43) Your firm provides training on human rights policies or procedures concerning aspects of human rights relevant to operations

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

44) Your firm has in place a policy that monitors suppliers' compliance with human rights, labour conditions and decent work

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

45) Does your firm participate in the UN's global compact programme?

Yes 2	No 1

46) Your firm organises medical check-up camps for workers at its operating sites

Almost Always 5	Sometimes 4	Once in a While 3	Rarely 2	Never 1

Diversity

47) Your firm has awareness programs to ensure diversity practices

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

48) Your firm has a diversity program to encourage suppliers to work with minority, smaller business, and women-owned business to empower diverse communities

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

49) Your firm supports associations and programs that strengthen diversity

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

50) Your firm has a policy to respect the diversity and differences of their employees to promote comfortable and safe work environment

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

51) Your firm purchases products and services from minority or women-owned business enterprise (MWBE) suppliers

Almost Always 5	Sometimes 4	Once in a While 3	Rarely 2	Never 1

Community development

52) Your firm has a policy on well-being and welfare of society

Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

5	4	3	2	1

53) Your firm has a policy to provide education and training for social development of communities

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

54) Your firm has a policy to improve the living conditions of communities and manufacturing units spread across its manufacturing plants

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

55) Your firm engages in social activities to support social-economic and community development

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

56) Your firm has anti-corruption policies

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

57) Your firm has a policy to recruit local and minority people

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

58) Your firm sources from local suppliers in order to provide economic benefit to the community

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

Economic development

59) Your firm has a policy on fair trade practices

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

60) Your firm has a policy on ethical practices

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

61) Your firm has a policy to enhance transparency measures

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

62) Your firm has a policy to encourage innovation

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

63) Your firm has a policy to ensure sustainable economic development in the area where manufacturing, projects and operations unit are located

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

64) Your firm has a policy to provide infrastructural development (services)

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

Philanthropy

65) Your firm volunteers at local charities

Almost Always 5	Sometimes 4	Once in a While 3	Rarely 2	Never 1

66) Your firm donates to philanthropic organisations

Almost Always 5	Sometimes 4	Once in a While 3	Rarely 2	Never 1

67) Your firm has a policy to donate at local communities to enhance the wellbeing of local people

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

68) Your firm encourages suppliers to participate in philanthropy activities like those stated above

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

Part C: Firm's perceived performance

69) What impact does the adoption of sustainable procurement practices have on the following performance measures?

	Very Positive Impact 5	Some Positive Impact 4	No Impact 3	Some Negative Impact 2	Very Negative Impact 1
Quality of products/services					
Net profit					
Procurement lead times					
Reduced costs					
Sales/turnover/revenue					
Market share					
Customer loyalty					
Reduced risks					
Innovation					
Use of advanced technology					
Competitive advantage					
Flexibility of processes					
Internal rate of return					
Others, please specify…					

70) The adoption of sustainable procurement practices has improved your firm's corporate sustainability and overall performance

Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1

71) What is your view on sustainable procurement practices within the Nigerian Oil & Gas sector?

……

APPENDIX 3

30th May, 2016.

Invitation letter to participate in research

To whom it may concern:

Research title: Exploring sustainable procurement practices in the Nigerian Oil & Gas sector

Dear Sir or Madam,

My name is Igho Ekiugbo, a research student at Salford Business School, University of Salford, Manchester UK. I am humbly inviting you to participate in the above research.

The primary aim of this research is to develop a sustainable procurement practice strategy in the Oil & Gas sector, which can be implemented by firms to achieve corporate sustainability and sustainable development goals in general. This practice is said to be vital for firms when considering issues of sustainability as the procurement function is a vital link between firms and their supply networks and can serve as a means of leveraging their sustainability views across the supply chain.

Considering the above, this research is seeking data from stakeholders within the Oil & Gas sector i.e., the operators (Oil & Gas firms), contractors, subcontractors and suppliers alike on their sustainable procurement practices. These data can be provided by personnel with managerial or executive responsibilities.

Research participation:
Participation in this research is not compulsory but solicited in order to achieve the research aim. Participants have the right to withdraw their consent at any point during the interview or survey process.

Confidentiality:
Any information and data collected as a result of this research will be dealt with in strict confidence and anonymity and will be used solely for this research (the production of a PhD thesis). The data and information will be kept securely during the research process and subsequently destroyed in accordance with the University of Salford data destruction policy after its usage.

Interviews and survey questionnaires time scale:
Each interview process is expected to last for about an hour depending on the interviewees, while the questionnaires due to their nature (open and close ended) will take roughly thirty minutes to complete.

Benefits and risk of the research:
There are currently no known risks, i.e. risks to the safety and wellbeing of participants, associated with this research. In terms of benefits, there are no direct benefits (e.g. compensation or gifts for participants). By participating, this research will help the researcher to reach his goal, which is to develop sustainable procurement practice strategy in the Oil & Gas sector. It is expected that this research will have indirect benefits to participants and the general public, as it will help improve the environmental, social and economic wellbeing of stakeholders.

Research findings:
The findings of this research will be used for the preparation and production of a PhD thesis and journal publications.

In the light of the above information this letter is formally seeking your permission to participate in this research. To give your consent please sign the attached consent form.

For further information or queries (if any) please write to the research supervisor:

Dr Christos Papanagnou
Lecturer in Logistics & Supply Chain Management
Room 611, Maxwell Building
Salford Business School
University of Salford
The Crescent
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United Kingdom
M5 4WT
+44(0)1612955091
c.papanagnou@salford.ac.uk

Thanks for your anticipated cooperation.

Igho Ekiugbo
PhD Student
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United Kingdom
M5 4WT
I.Ekiugbo@edu.salford.ac.uk
+44(0)7507892817

APPENDIX 4

University of Salford MANCHESTER

Research information sheet

To whom it may concern:

Research title: Exploring sustainable procurement practices within the Nigerian Oil & Gas sector

Researcher: Igho Ekiugbo
Salford Business School
University of Salford
Greater Manchester
United Kingdom
M5 4WT

Research outline: This research will focus on how the procurement function can be used to achieve corporate sustainability within firms and sustainable development goals in general. It is principally to investigate and analyse the current sustainable procurement practices within the Nigerian Oil & Gas sector and thereafter suggest ways in which such practices can be improved within the sector – the strategy development. In this regard the formulated research objectives are:

1) To identify the current state of sustainable procurement practices in the Nigerian Oil & Gas sector;
2) To identify the barriers and drivers to the implementation of sustainable procurement practices in the Nigerian Oil & Gas sector;
3) To ascertain the critical dynamics that could help firms within the Nigerian Oil & Gas sector to implement sustainable procurement practices;
4) To establish whether sustainable procurement practices within the Nigerian Oil & Gas sector impact on firms' performances and whether they improve corporate sustainability;

5) To establish whether firms' characteristics have an influence on the adoption of sustainable procurement practices;

6) To ascertain whether ISO-14001 accreditation influences firms towards sustainable procurement adoption;

7) To ascertain whether OHSAS-18001 (Occupational Health & Safety Management Systems) certification influences firms towards sustainable procurement adoption;

8) To develop a strategic framework to help firms implement sustainable procurement practices within the Nigerian Oil & Gas sector.

Information will be sought and obtained from players within the Nigerian Oil & Gas sector, such as operators, contractors, sub-contractors and suppliers of different tiers (the respondents) because the research seeks to investigate the adoption and implementation of sustainable procurement practices within the sector.

Any data obtained as a result of this research will be used solely for this research (the production of a PhD thesis) and treated with strict confidence and anonymity. Also, upon the completion of this research, these data will be securely destroyed in accordance with the University of Salford data destruction policy.

Please direct queries (if any) regarding to this research to:

Dr Christos Papanagnou
Lecturer in Logistics & Supply Chain Management
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APPENDIX 5

University of Salford MANCHESTER

Informed Consent Form

Name:

Position:

Name of firm:

Address:

Date:

Request for anonymity: Yes ( ) No ( )

I, the above-named participant, hereby confirm my willingness and readiness to participate in this research having been recruited by the researcher (Igho Ekiugbo) of Salford Business School, University of Salford, Manchester, UK in the research titled: ***"Exploring sustainable procurement practices in the Nigerian Oil & Gas sector".***

It is confirmed that the researcher has obtained the necessary permission needed for me to participate in this research from my employer. I also confirm that there are no known risks or hazards associated with this research and that my responses and input will be treated in strict confidence by the researcher. I am aware that my participation is completely voluntary and that I have the right to withdraw from this research at any point during the interview or survey process without providing reasons for doing so.

I understand also that I may provide the information and data anonymously by clearly indicating so above. In this event, the researcher will attach a unique identifier to my response to inform the researcher alone of the original source of the data. I hereby give my consent, with the understanding that the information I am giving would be used as data for the purpose of the above research.

Participant's signature……… **Date…**……