

EVALUATION OF LEVEL OF ADOPTION OF SUSTAINABILITY PRACTICES AMONG CONSTRUCTION FIRMS IN THE NIGER DELTA STATES OF NIGERIA

Monday Otali¹ and Michael G. Oladokun²

¹Department of Building, Faculty of Environmental Studies, University of Uyo, Uyo, Nigeria, otalimunday@yahoo.com

²Department of Building, Faculty of Environmental Studies, University of Uyo, Uyo, Nigeria, michael.g.oladokun@uniuyo.edu.ng

ABSTRACT

The need for sustainable development in Niger Delta, Nigeria cannot be overemphasised. Hence the aim of this research is to evaluate the level of adoption of sustainability practices among construction firms in Niger- Delta, Nigeria. Data were obtained using 1179 copies of structured questionnaire, administered through random sampling technique. The methods of data analysis were simple percentage, mean score, Kruskal – Wallis test and Bonferron – Dunn test. The average mean score of 2.91 indicates that the overall level of adoption of sustainability practices among construction firms in Niger Delta is moderate. The P-value of 0.001 is less than 0.05 significance level; hence, the hypothesis was rejected. This indicates that there is a significant difference in the level of adoption of sustainability practices among the states in Niger Delta, Nigeria. This implies that construction firms operating in each of the states in Niger Delta did not record the same level of adoption of sustainability practices. This study concluded that firms' location have significant impact on the level of adoption of sustainability practices by the construction firms in Niger Delta. This study recommends government should pass into law, legislations that would encourage the adoption of sustainability practices by the construction firms in Niger - Delta, Nigeria. This study also recommends that construction firms should improve on their level of adoption of sustainability practices in Niger Delta by increasing top management support, human resource management, employee empowerment, training and educating employees on sustainability practices and increasing the amount of resources allocated to sustainability.

Keywords: Adoption level, construction firms, sustainability practices, Niger Delta, Nigeria.

1. INTRODUCTION

There is a wide range of threats to the environment and socio economic development in the world today. The construction industry is one of the industries contributing to these threats. The construction industry has been argued to be an important industry for the development of every society. However, it takes up many non-renewable resources and contributes to natural resources depletion as well as responsibility for high levels of pollution, climate change and other environmental threats (Klang *et al.*, 2003). Suliman and Abdelnaser (2009) observed that construction accounts for an estimated 40% of all resources consumption and produces about 40% of all wastes including greenhouse gas emissions. The study of Ijigah *et al.* (2013) also revealed major environmental impacts of building construction projects to include environmental pollution, depletion of resources and habitat destruction causing destruction of ecosystem, desertification, soil erosion and increasing material wastage. Similarly, Saroop and Allopi (2014) elucidated that the construction industry globally is one of the main contributors to the depletion of natural resources and a major cause of unwanted side effects such as air and water pollution, solid waste, deforestation, health hazards, global warming, and other negative consequences.

Construction industry has a role to play in ensuring a healthy-liveable environment and equitable access to social infrastructure and sustainable development in developing countries (Kheni & Akoogo, 2015). This will help in achieving the sustainable development goal in developing countries. According to Chambers (1993), sustainability is defined as “that which is capable of being sustained; in ecology, the amount or degree to which the earth’s resources may be exploited without deleterious effects”. Sustainability at the firm level refers to meeting social and environmental needs in addition to the firm’s profitability (Porter, 2008). Furthermore, Brundtland (1987) reported that the only way to balance the eternal trade off between economic development and environmental protection was through a new approach, namely sustainable development (SD). Brundtland (1987) defined sustainable development (SD) as development that meets the needs of the present without comprising the ability of future generations to meet their needs. Furthermore, sustainable construction is the application of sustainable development principles in the construction industry. Parkin (2000) described sustainable construction as a construction process that incorporates the basic themes of sustainable development, and it aims at reducing the environmental impact of a building over its entire lifespan, providing safety and comfort to its occupants and at the same time enhancing its economic viability (Addis & Talbot, 2001).

In Nigeria, the Government indicated its commitment on sustainable development by convening several awareness campaigns and conferences (Federal Ministry of Environment Housing & Urban Development, 2008). The Green Building Council of Nigeria was conceived and Professional bodies allied to the sector are taking keen interest (Akindoyeni, 2012), but the effort has not yielded the desired results. Put simply, Nigeria is lagging behind world developments associated with sustainability within the construction sector and beyond (Dania *et al.*, 2013). Waziri *et al.* (2015) studied green construction practices implementation in Nigeria. The study stated that sustainable practices is slightly implemented at firm level while they are moderately implemented at both individual and project level. Waziri *et al.* (2015) stated that the level of sustainability practices’ adoption in Nigeria falls below international standard. Other studies carried out on sustainability issues in Nigeria include Ikediashi *et al.* (2012), Ujene (2014), Ijaiya

(2014), Ekung *et al.* (2014), and Barde and Tela (2015), with very scanty study in Niger Delta in particular.

The Niger Delta that is located in the southern part of Nigeria has some peculiar characteristics ranging from the climate, terrain, vegetation, culture, economic activities and value system. The Niger Delta Region of Nigeria produces a significant portion of the aggregate oil wealth of Nigeria. Since 1956 when oil was first discovered in Oloibiri in Southern Nigeria, the Niger Delta region has accounted for over 90 per cent of Nigeria's oil income (Ujene, 2014). However, the region has perennially suffered from environmental neglect, crumbling infrastructures and services, high unemployment, social deprivation, abject poverty and endemic conflict. Apart from the environmental degeneration suffered due to oil exploration, the fact that several construction activities which have been on to accommodate the activities and growing population, also add to the degeneration of the environment. This has led to calls for firms operating in the Niger Delta to demonstrate the value of their investments to Nigeria by undertaking increased community development initiatives that provide direct social benefits such as local employment, new infrastructure, schools, and improved health care delivery (Ijaiya, 2014). As such, this study evaluated the level of adoption of sustainability practices among construction firms in Niger Delta, Nigeria. The study also tested the hypothesis, which states that there is no significant difference in the level of adoption of sustainability practices among the construction firms operating in Niger Delta, Nigeria.

2. THEORETICAL DEVELOPMENT FOR THE STUDY

In order to underpin the study with appropriate theoretical lens, the study used the critical theory and institutional theory as the theoretical basis for this study. As such, the following sub-sections further discuss the theories.

2.1 Critical Theory

The central goal of critical theory in organisational studies is to form societies and workplaces, which are free from domination. In this context, critical theory promotes an equal opportunity for members to contribute to the development of systems, which meet human needs and lead to the progressive development (Ogbor, 2001). The purpose of critical theory is to create a body of knowledge that seeks to achieve an emancipator interest through a critique of consciousness and ideology (Ogbor, 2001). Environmental degradation and the implication for the rights of the Niger Delta people both to a safe environment and to meaningful living within their location are the cause of the continuing conflict and tension between the people and the government and corporations (Akhakpe, 2012; Odoemene, 2011). This theory was applied in this study because of the need to establish the level of adoption of sustainability practices among construction firms in order to create an enhanced body of knowledge of sustainability at firm level. This will in turn reduce the level of conflict and tension between the firms and people of Niger Delta.

2.2 Institutional Theory

Institutional theory was first suggested by Selznick (1948), who argued that the behaviour of a company could be influenced by its institutional environment. The central idea of this theory states that "organizations must conform to the established rules and norms of dominant institutions in order to gain support and be perceived as legitimate"

(John, Cannon and Pouder, 2001). Institutional theory has also been widely applied in sustainability research when considering cross-industry and cross-location comparisons. The expansion of the notion of sustainability necessarily takes different paths in different industries and locations (Chen, 2015). In other words, specific institutional settings within a particular location/industry can influence how the organisation engages in sustainability activities and the level of engagement, as well as performance. This theory was applied in this study because it served as a basis for establishing the effect of sustainability factors and firm characteristics on the level of adoption of sustainability practices of construction firms in the study area.

3. EXTANT LITERATURE ON SUSTAINABILITY PRACTICES OF CONSTRUCTION FIRMS

Sustainability at the firm level refers to meeting social and environmental needs in addition to the firm's profitability (Porter, 2008). The variables for measuring the level of sustainability adoption are the firm sustainability practices as identified within the body of literature (Al-Jamea, 2014; Inkoom, 2013; Eccles, Ioannun & Serafeim, 2012; Freeman, Harrison & Wicks, 2007; Sommerville & Craig, 2006; Widen, 2003). These variables include leadership, knowledge management practices, organisational innovativeness, organisational culture, corporate governance, stakeholder engagement, transparency and measurement, corporate social responsibility, employment practices and protection of the environment. They are further discussed in the following sub-sections.

3.1 Leadership in Construction Firms

There are several areas in the construction industry in which an understanding of the role of individual sustainability leaders is needed. With the current pressure on construction organisations to integrate sustainability in their operations and business strategies, there is increasing demand for leaders who can stimulate a sustainability vision to become part of organisational identity. These individual leaders are the key players in the creation, development and growth of successful sustainability strategies, and ultimately serve as role models from whom new sustainability ideas can be subsequently disseminated out into the wider organisation (Inkoom, 2013).

3.2 Knowledge Management Practices

Knowledge management (KM) can be described as a systematic process of discovering, choosing, arranging, refining and presenting information in such a way that it improves an employee's comprehension relative to a specific area of interest (Sommerville & Craig, 2006). Emmitt and Gorse (2003) stated KM is the process by which information is created, captured, stored, shared, transferred, implemented, exploited, and measured to meet the needs of an organisation. In other words, KM is the discipline of creating a thriving work and learning environment that fosters the continuous creation, aggregation, use, and re-use of both organisational and personal knowledge in the pursuit of new business value (Quintas, 2005). This process and action oriented definition of KM indicates that it may be applicable to the improvement of the organisational performance. This is because the construction industry, which is a major sector for the delivery of key government programmes / or infrastructure, is an industry that is heterogeneous, diverse, multi-organisational, and dominated by small and medium size enterprises (SMEs). The

high levels of service-inputs characterised by professional knowledge or expertise relative to a specific technical or functional domain may qualify the industry as a knowledge-intensive industry. In fact, documented research findings indicated that design, architecture, surveying, and other construction services are knowledge-intensive service sectors (Egbu & Robinson, 2005). Within any organisation, KM may perhaps have the same degree of importance as labour, plant, and materials (Sommerville & Craig, 2006).

3.3 Organizational Innovativeness

Innovation is the application of new knowledge in an industry in the form of new products, new processes, social change, and organisational change (Widen, 2003). According to the Organisation for Economic Co-operation and Development (OECD, 2005), innovation is defined as a new or significantly improved product (good or service), process (production or delivery method), marketing method (packaging, promotion, or pricing) or managerial method (internal practice). Innovation is neither a single nor an instantaneous act, but rather it is a whole sequence of events that occurs over time, which involves all activities related to bringing new products to the market (Jones & Saad, 2003).

3.4 Organisational Culture

The relationship between organisational culture and sustainability adoption is well documented in the literature (Sharma, 2002; Wong & Avery, 2009; Linnenluecke & Griffiths, 2010; D'Incognito, Costantino and Migliaccio, 2013; Al-Jamea, 2014). The culture within an organisation, according to Trong Tuan, (2012), is a continuous process of identity building/re-building and meaning-making within an organization, which enables its social integration as well as sustainability of its sub-divisions. It is defined in this study as construction firm's pattern of shared values and beliefs shaping their organisational functions and explaining the norms for behaviour within the organisation.

3.5 Corporate Governance

The responsibilities of the board of directors and the incentives provided to top management are two fundamental attributes of the corporate governance system. Boards of directors perform a monitoring and advising role and ensure that management is making decisions in a way that is consistent with organizational objectives. Eccles, Ioannun and Serafeim, (2012) posited that for organizations that consider environmental and social objectives as core issues for their strategy and operations, the board of directors is more likely to have direct responsibility over such issues; it is also more likely that top management compensation will be a function of sustainability metrics in addition to other traditional financial performance metrics.

Other functions include assisting management in setting strategy, establishing goals, and integrating sustainability into daily business activities, reviewing new and innovative technologies that will permit the company to achieve sustainable growth, reviewing partnerships and relationships that support the company's sustainable growth, and reviewing the communication and marketing strategies relating to sustainable growth. Another important governance feature is the set of metrics that are linked to senior

executive compensation. High sustainability firms are more likely to align senior executive incentives with environmental, social, and external (customer) perception performance metrics, in addition to financial metrics.

3.6 Stakeholder Engagement

Engagement is necessary for understanding the stakeholders' needs and expectations in order to make decisions about how best to address them (Freeman, Harrison & Wicks, 2007). With regards to stakeholder management, prior literature has suggested and empirically shown that it is directly linked to superior financial performance by enabling firms to develop intangible assets in the form of strong long-term relationships, which can become sources of competitive advantage (Hillman & Keim, 2001). In other words, superior stakeholder engagement is fundamentally based on the firm's ability to establish such relationships with key stakeholders over time. Similarly, it has been argued that when a firm is able to credibly commit to contracting with its stakeholders on the basis of mutual trust and cooperation and a longer-term horizon as opposed to contracting the firm will experience reduced agency costs, transactions costs, and costs associated with team production (Foo, 2007; Cheng, Ioannou, & Serafeim, 2011).

3.7 Transparency and Measurement

The transparency principle is about disclosure of information to company stakeholders. Epstein (2008) noted that transparent companies provide full disclosure to existing and potential investors and lenders of fair and open communication related to the past, present, and likely future financial performance of the company. They identify their stakeholders, and recognize that they are accountable to internal and external stakeholders, understanding both their informational needs and their concerns about the company's effects on their lives. Performance measurement is essential for management to determine how well it is executing on its strategy and to make any necessary corrections (Kaplan & Norton, 2008). The quality, comparability, and credibility of information are enhanced by internal and external audit procedures that verify the accuracy of this information or the extent to which practices are being followed.

3.8 Corporate Social Responsibility

Crowther (2000) defined corporate social responsibility (CSR) as an approach to reporting a firm's activities which stresses the need for the identification of socially relevant behaviour, the determination of those to whom the company is accountable for its social performance and the development of appropriate measures and reporting techniques. It is also seen to be the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as at the local community and the society at large (World Business Council for Sustainable Development, 2002). Thus by implication, CSR involves a voluntary act by organisations to integrate social and environmental concerns in their undertakings with numerous stakeholders. The stakeholders include all the members belonging to the corporation's social environs, which contribute to or are encumbered by the corporation's activity. Branco and Rodrigues (2006) supported this view as well.

3.9 Employment Practices

This principle of corporate sustainability embodies the type of management practices organizations engage in (Epstein, 2008). Adoption of this principle means that firms engage in management practices that promote personal and professional employee development, diversity and empowerment. These organizations regard employees as valued partners in the business, respecting their right to fair labour practices, competitive wages and benefits, and a safe, family friendly work environment. They recognised that concern for and investing in employees is in the best long-term interests of the employees, the community, and the company. Consequently, they strive to increase and maintain high levels of employee satisfaction and respect international and industry standards for human rights. To do this they offer programs such as tuition reimbursement, family leave time, and career development opportunities.

3.10 Protection of the Environment

In order to adopt sustainable principles, companies must define their commitment to the natural environment. Organizations espousing this principle strive to protect and restore the environment and promote sustainable development with products, processes, services, and other activities. These organizations are committed to minimizing the use of energy and natural resources and decreasing waste and emissions. At a minimum, they comply with all existing international, national, and local regulations and industry standards regarding emissions and waste. They strive for continuous improvement in the efficiency with which they use resources, and strive to reduce the environmental impact of their activities. They are committed to maximize the use and production of recycled and recyclable materials.

According to Inkoom (2013), the following variables are used to measure firms' commitment to environmental protection. These include: Building designs, construction practices and technologies that are environmentally friendly and sustainable; Effective communication of sustainability and other environmental management issues among contractors, suppliers and other professionals engaged by the organisation; Standardized management systems such as ISO 14001 or Environmental Management Systems (EMS) in your organisation; The use of practices such as implementing effective environmental management Programmes, and engaging professional who are ISO 14000 certified; The inclusion of sustainability and other environmental management measures in tendering requirement.

Nwokoro (2011) also identified the following variables for measuring firms/organisations' commitment to protection of the environment. These include: periodic environmental audit of the firm; development of special training programmes for upgrading knowledge and skills in various discipline required for environmental management; approximate technology that recognise the need to save on energy and which is cost-effective; facilitating management control of environmental practices; development of environmental management plan to reverse environmental degradation, protect human health and the environment; and installing effective machinery to enhance environmental awareness through public enlightenment.

4. RESEARCH METHODOLOGY

The survey research design was used to evaluate the level of adoption of sustainability practices among construction firms operating within the Niger Delta region of Nigeria. In addition to the review of related literature, the bulk of data for this research were sourced from construction firms in Niger Delta, Nigeria through questionnaire survey. The population for the study is the construction firms operating within the Niger Delta region of Nigeria. The population frame for the study was established as evidenced from the Corporate Affairs Commission of Nigeria. This was established to be 1781 as shown in Table 1. The population was stratified based on States in the Niger Delta region and proportional representation was applied to distribute the sample size among the various States in Niger Delta (Table 1). Data were obtained using 1179 copies of structured questionnaire, administered through random sampling technique. Data were collected on a five-point scale of 1, 2, 3, 4 and 5 and were assigned to the options of no adoption, low adoption, moderate adoption, high adoption and very adoption respectively.

Simple percentage was used to analyse the background information regarding the construction firms among the States in Niger Delta region. In order to rank and determine the level of adoption of sustainability practices among construction firms in Niger Delta, the mean item score was used. The level of adoption of sustainability practices was analysed using mean score and the decision rule is that any sustainability practice whose mean falls between 1.0 -1.8 is of no adoption, 1.8-2.6 is of low adoption, 2.6-3.4 is of moderate adoption 3.4-4.2 is having high adoption and 4.2-5.0 is regarded as having very high adoption. This is in agreement with Kazaz *et al.* (2008). In testing the hypothesis postulated for the study, Kruskal – Wallis test was used to explore if there is a significant difference in the level of adoption of sustainability practices among the construction firms operating in Niger Delta, Nigeria. A post hoc test was performed using Bonferroni-Dunnnett test to establish the source of significant variation found on some of the variables in the level of adoption of sustainability practices.

4.1 Sample Frame and Sample Size

Table 1 shows the sample frame and sample size of this study. The Sample size was determined using the Yamane (1967) equation as shown below:

$$n = \frac{N}{1 + N (e)^2}$$

Where n = Sample size

N = Finite population

e = Level of significance (0.05).

1 = Unity

This study adopted Yamane (1967) equation for determining sample size because of its simplicity, reliability and validity. These have encouraged its wider acceptance and usage among researchers over a long period of time.

Table 1: Sample frame and sample size of construction firms in Niger Delta

State	Sample Frame	Sample Size
Abia	165	117
Akwa Ibom	214	139
Bayelsa	128	97
Cross River	223	143
Delta	200	133
Edo	237	149
Imo	143	105
Ondo	221	142
Rivers	250	154
Total	1781	1179

5. DATA PRESENTATION AND DISCUSSION OF RESULTS

This section contains the results of the analysis of data collected for the study. It contains the descriptive results of the response rate of questionnaire, firm characteristics. This section also contains the result of evaluation of the level of adoption of sustainability practices among construction firms in Niger- Delta, Nigeria and the result of the hypothesis.

5.1 Questionnaire Distribution and Response in the Study

One of the research instrument used in this study was structured questionnaire. The questionnaire was administered among the construction firms operating in Niger Delta, Nigeria. The results of analysis were presented in Table 2.

Table 2 showed that the number of questionnaire administered to the construction firms in Niger Delta were 117, 139, 97, 143, 133, 149, 105, 142, and 154 in Abia, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Imo, and Rivers state respectively. From the questionnaire distributed, the response rate ranges between 76.1% and 94.7%. Delta state received the highest response rate of 94.7% while Abia State got the least rate of 76.1 %. In all, an overall response rate of 83.2% was achieved. Groves (2006) noted that a response rate of at least 50 percent is considered adequate for analysis and reporting, a response of 60 percent is good and a response rate of 70 percent is very good. As a guide, researchers typically seek response rates of at least 70% to feel confident that their sample is representative of the sample frame. Hence, the overall response rate of 83.2% in this study is considered very good and adequate.

Table 2: Questionnaire distribution and response rate

S/N	States	Number of questionnaire administered on construction firms (NO)	Number of questionnaire returned (NO)	Percentage of questionnaire returned (%)	Average of the Response Rate (%)
1	Abia	117	89	76.1	
2	Akwa Ibom	139	113	81.3	
3	Bayelsa	97	85	87.6	
4	Cross River	143	112	78.3	
5	Delta	133	126	94.7	
6	Edo	149	114	76.5	
7	Imo	105	92	87.6	
8	Ondo	142	109	76.8	
9	Rivers	154	140	90.1	
10	TOTAL	1179	980		83.2

5.2 Firm Characteristics

Firms' characteristics comprised of age of construction firms, location of construction firms, ownership of construction firms and size of construction firms.

5.2.1 Age of Construction Firms

The analysis of the age of construction firms that were sampled in this study possessed showed that work experience of the firms ranged between the intervals of 1-5, 6-10, 11-15, 16-20 and above 20 years with their percentage distribution of 1%, 3.8%, 16.4%, 40.9% and 37.9% respectively. Table 3 reveals that majority of the construction firms have age ranging from 16-20. Table 3 also shows that more than 95% of the firms have work experience above ten (10) years. It therefore implies that the work experiences of the construction firms are adequate and their responses can be relied on.

Table 3: Age of construction firms

Age of Firms	Frequency	Valid Percent	Cumulative Percent
1-5	10	1.0	1.0
6-10	37	3.8	4.8
11-15	161	16.4	21.2
16-20	401	40.9	62.1
Above 20years	371	37.9	100.0
Total	980	100.0	

5.2.2 Location of Construction Firms

Table 4 shows the distribution of construction firms in each state in Niger Delta, Nigeria. The percent of firms in Abia, Akwa Ibom, Bayelsa and Cross Rivers states are 9.1%, 11.5%, 8.7% and 11.4%. Others are Delta, Edo, Imo, Ondo and Rivers with their percents of 12.9%, 11.6%, 9.4%, 11.1% and 14.3% respectively. Table 4 shows a good distribution of the construction firms among the states in Niger Delta. This implies that the results from this study represents the situation in Niger Delta and can be relied on.

Table 4: Location of construction firms

States	Frequency	Valid Percent	Cumulative Percent
Abia state	89	9.1	9.1
Akwa Ibom state	113	11.5	20.6
Bayelsa state	85	8.7	29.3
Crossriver state	112	11.4	40.7
Delta state	126	12.9	53.6
Edo state	114	11.6	65.2
Imo state	92	9.4	74.6
Ondo state	109	11.1	85.7
Rivers state	140	14.3	100.0
Total	980	100.0	

5.2.3 Ownership of Construction Firms

The result of analysis on Table 5 shows that the locally owned construction firms account for 96.4% of the total number of firms considered in this study while the foreign owned firms account for 3.6% of the total number construction under consideration in this study. This clearly shows that majority of the construction firms operating in Niger Delta are predominantly locally owned firms.

Table 5: Ownership of construction firms

Ownership of Firms	Frequency	Valid Percent	Cumulative Percent
Locally owned	945	96.4	96.4
Foreign owned	35	3.6	100.0
Total	980	100.0	

5.2.4 Size of Construction Firms Under Studied in Niger Delta between 2007-2016

Analysis on Table 6 shows the average percentage distribution of construction firms in Niger Delta according to their sizes over a period of ten years (2007-2016). The analysis

shows that small firms account for 84.7%, medium firms account for 11.61 and large construction firms account for 3.73%. This reveals that small and medium construction firms are of the majority. This result is in consonance with Abdullah, Bilau, Enegbuma, Ajagbe, Ali and Bustani, (2012) and Thwala, Ajagbe, Enegbuma, Bilau and Long (2012) who posited that firms in the construction industry have been grouped such that Small and Medium Firms (SMFs) were found to be the majority.

Table 6: Size of construction firms under studied in Niger Delta between 2007- 2016

S/N	YEAR	1-50		50-250		250 AND ABOVE	
		FREQ	PER	FREQ	PER	FREQ	PER
1	2007	857	87.4	88	9.0	35	3.6
2	2008	790	80.6	155	15.8	35	3.6
3	2009	842	85.9	103	10.5	35	3.6
4	2010	821	83.8	120	12.2	39	4.0
5	2011	813	83.0	129	13.2	38	3.9
6	2012	754	76.9	188	19.2	38	3.9
7	2013	811	82.8	131	13.4	38	3.9
8	2014	870	88.8	75	7.7	35	3.6
9	2015	868	88.6	77	7.9	35	3.6
10	2016	874	89.2	71	7.2	35	3.6
AVE.			84.7		11.61		3.73

5.3 Level of Adoption of Sustainability Practices among Constructions Firms in Niger Delta, Nigeria

The results of analysis on the level of adoption of sustainability practices among construction firms in Niger Delta, Nigeria were presented as follows. Table 7 shows the level of adoption of sustainability practices among construction firms in Niger Delta. The result of analysis reveals that the level of adoption of leadership traits among firms in Abia and Imo is moderate while the level of adoption of leadership in construction among firms in Akwa Ibom, Bayelsa, Cross river, Delta, Edo, Ondo and Rivers is high. The mean score of 3.60 shows that the overall level of adoption of leadership traits among firms in Niger Delta is high.

Table 7 shows that the level of adoption of knowledge management among the construction firms in Niger Delta is moderate except those firms operating in Abia state which have low level of adoption. Table 7 also indicates that the level of adoption of brainstorming among the construction firms in Niger Delta is high. The level of adoption of face to face interaction, mentoring, recruitment and training among the firms is moderate. Also community of practice and apprenticeship have low level of adoption among the firms. The average mean score of 2.82 also indicates that the overall level of adoption of knowledge management practices is moderate.

Table 7 reveals that the level of adoption of organisational innovativeness among the construction firms in Abia, Akwa Ibom, Bayelsa, Edo, Imo, Ondo and River is moderate. However, there is high level of adoption of organisational innovativeness among the firms in Crossriver and Delta states. The result showed that there was high level of protection of business intellectual property among the firms, building relationship with existing clients is also high. The result reveals that that the level of delivering products/

services that reduce clients' cost is high among the firms. Other innovative practices that have high level of adoption include active monitoring of international best practice, maintaining a formal system for transferring project learning into continuous business processes and measuring how well their changes have worked. The result also shows that there is moderate level of recruitment of experienced employees, recruitment of new graduates and usage of multi- skilled teams. Other innovative practices that have moderate level of adoption among the construction firms in Niger Delta include enhancement of firms' business technical capability, investment in research and development and participating in the development of industry standards and practices. The overall level of adoption of organisational innovativeness among the firms operating in Niger Delta is moderate as indicated by the average mean score of 3.30.

The level of adoption of organisational culture practices among the construction firms in Abia, Akwa Ibom, Bayelsa, Imo, Ondo and Rivers States is moderate with their mean score ranging between 2.96 and 3.22. However, the construction firms operating in Crossriver, Delta and Edo highly adopted the organisational culture practices. The average mean score of 3.25 shows that the overall level of adoption of organisational culture practices is moderate among the construction firms operating in Niger Delta.

Table 7 shows that securing ownership of registration is the only corporate governance practice that has high level of adoption among the construction firms. The corporate governance practices that have moderate level of adoption are disclosure of objectives, disclosure of foreseeable risks, board members act on fully informed basis and board members act in the interest of the firm and its shareholders. Others include application of high ethical standards by board, fair treatment to all shareholders by board members and the ability of the board to oversee the process of disclosure and communication as well as objective and independent judgement by the board. Table 7 also reveals that the level of adoption of corporate governance in each of the nine states in Niger Delta is low. The average mean score of 2.41 also indicates that the overall level of adoption of corporate governance among construction firms in Niger Delta is low.

Furthermore, Table 7 reveals that there is high level of examination of opportunities and risks among the construction firms in Niger Delta. Furthermore, there is moderate level of stakeholder identification, training of local managers, and ability of the stakeholders to express their concerns. Others that have been moderately adopted by the firms are grievance mechanisms, scope agreement, setting of targets for stakeholders, board feedback and result reporting. It was revealed that the level of public reports of the firms is low. All the construction firms operating in each state in Niger Delta, except those in Abia state moderately engaged the stakeholders in their quest to ensure sustainable development within their area of operation. However, those firms in Abia state have low level of stakeholder engagement. The average mean score of 2.98 indicates that the overall level of engagement of stakeholder among the construction firms is moderate.

Table 7 shows that there is high level of mapping against established standards by the construction firms. Some of the transparency and measurement strategies that were moderately adopted include information collection review, data aggregation review and document review. Others include relevant management interviews, relevant management discussions and stakeholders' consultation. The practices that had low level of adoption by the construction firms include sustainability report external audit, auditor competency disclosure, external audits, standardised external audits and internal audits. The result

also shows that the level of adoption of transparency and measurement among construction firms in Bayelsa, Cross River, Delta, Edo, Imo, Ondo and River state is moderate while there is low level of adoption of transparency and measurement among firms operating in Abia and Akwa Ibom states. The average mean score of 2.91 indicates that the overall level of adoption of transparency and measurement among construction firms in Niger Delta is moderate.

Table 7 shows that the level of employment opportunities provided by the construction firms operating in Niger Delta is moderate. It also reveals that the firms provided moderate level of infrastructural development, human capital development and peace and security. The results also show that the level of commitment of the construction firms in Niger Delta to public and private sector investment is low. Others that suffered low commitment from the firms include bio-diversity and ecosystem stability, poverty reduction, pollution control, provision of health care and development of sport/ art and culture. Table 7 also reveals that the level of adoption of corporate social responsibility among the construction firms operating in Abia, Akwa Ibom, Bayelsa, Crossriver, Delta and Ondo states is low while those in Edo , Imo and river states have moderate level of adoption of corporate social responsibility. The average mean score of 2.55 indicates that the overall level of adoption of corporate social responsibility among the construction firms in Niger Delta is low.

Employment practices adopted by construction firms in Niger Delta were evaluated and the result shows that the level of training of personnel and the level of teamwork is moderate. Table 7 also shows that the level of adoption of wages /salary induced motivation, social dialogue and flexible working time is low. The result shows that firms operating in Edo, Imo and Rivers have moderate level of adoption of the employment practices while those firms operating in Abia, Akwa Ibom, Bayelsa, Cross river, Delta and Ondo have low level of adoption of employment practices. The average mean score of 2.47 shows that the overall level of adoption of employment practices among construction firms in Delta state is low.

Table 7 reveals that there is high level of adoption of building designs, construction practices and technology that are environmentally friendly and sustainable. The level of effective communication of sustainability and other environmental management issues among contractors, suppliers and other professionals engaged by the firms is moderate. However, standardised management systems such as ISO 14001, implementation of effective management programme, and the inclusion of sustainability and other environmental management measures in tendering requirement had low level of adoption among the construction firms. Others that had low level of adoption include periodic environmental audit of the firm, application of technology that are energy and cost effective, development of environmental plan to reverse environmental degradation, protect human health and the installation of effective machinery that enhances environmental awareness through public enlightenment. The result also shows that the level of adoption of practices that protect the environment among the construction firms in each of the states in Niger Delta is low. The average mean score of 2.51 indicates that the overall level of adoption environmental protection practices among the firms in Niger Delta is low. The mean scores ranging between 2.78 and 3.04 imply that the construction firms operating in each state of Niger Delta recorded moderate level of adoption of sustainability practices. The average mean score of 2.91 indicates that the overall level of adoption of sustainability practices among construction firms in Niger Delta is

'moderate level'. This study is in contrast with Waziri, Yusof and Osmadi (2015) who studied green construction practices and concluded that sustainable practices are slightly implemented at firm level.

Table 7: Level of adoption of sustainability practices among constructions firms in Niger Delta, Nigeria

Sustainability Practices	Mean Score	Remark	M.S AKS N=113	Remark	MS BYS N=85	Remark	MS CRS N=112	Remark	MS DTS N=126	Remark	MS EDS N=114	Remark	MS IMO N=92	Remark	MS Ondo N=109	Remark	MS RIV. N=140	Remark	Combi ned MS N=980	Remark
Knowledge Management Practices																				
Brainstorming	3.12	M.LAD	3.63	H.LAD	3.59	H.LAD	3.97	H.LAD	3.98	H.LAD	3.75	H.LAD	3.65	H.LAD	3.66	H.LAD	3.64	H.LAD	3.69	H.LAD
Face –to- face interaction	2.73	M.LAD	3.27	M.LAD	3.02	M.LAD	3.34	M.LAD	3.36	M.LAD	3.26	M.LAD	3.13	M.LAD	3.19	M.LAD	3.19	M.LAD	3.18	M.LAD
Mentoring	2.39	L.LAD	2.74	M.LAD	2.55	L.LAD	2.79	M.LAD	2.87	M.LAD	2.96	M.LAD	3.22	M.LAD	2.63	M.LAD	2.79	M.LAD	2.78	M.LAD
Level of Adoption of Knowledge Management Practices among Firm in Niger Delta, Nigeria	2.45	L.LAD	2.79	M.LAD	2.67	M.LAD	2.83	M.LAD	2.88	M.LAD	2.96	M.LAD	3.17	M.LAD	2.73	M.LAD	2.85	M.LAD	2.82	M.LAD
Organisational Innovativeness: Employee Strategies																				
Recruiting experienced employee	2.48	L.LAD	2.99	M.LAD	2.76	M.LAD	3.11	M.LAD	3.15	M.LAD	3.13	M.LAD	3.30	M.LAD	2.88	M.LAD	2.96	M.LAD	2.99	M.LAD
Actively encouraging your employees to seek out improvements and share ideas	3.37	M.LAD	3.85	H.LAD	3.72	H.LAD	3.59	H.LAD	3.65	H.LAD	3.38	M.LAD	3.22	M.LAD	3.48	H.LAD	3.29	M.LAD	3.50	H.LAD
Providing or supporting training programs for your Employees	3.01	M.LAD	2.97	M.LAD	3.32	M.LAD	3.46	H.LAD	3.44	H.LAD	3.44	H.LAD	3.22	M.LAD	3.12	M.LAD	3.00	M.LAD	3.22	M.LAD
Technology Strategies																				
Enhancing your business’s technical capabilities	3.07	M.LAD	3.20	M.LAD	3.31	M.LAD	3.36	M.LAD	3.38	M.LAD	3.46	H.LAD	3.00	M.LAD	3.28	M.LAD	3.21	M.LAD	3.26	M.LAD
Protecting your business’s intellectual property	3.24	M.LAD	3.42	H.LAD	3.39	M.LAD	3.45	H.LAD	3.44	H.LAD	3.51	H.LAD	3.35	M.LAD	3.43	H.LAD	3.56	H.LAD	3.43	H.LAD
Participating in the development of industry standards and practices	3.17	M.LAD	3.35	M.LAD	3.41	H.LAD	3.57	H.LAD	3.59	H.LAD	3.51	H.LAD	3.13	M.LAD	3.29	M.LAD	3.16	M.LAD	3.36	M.LAD
Marketing Strategies																				
Building relationships with existing clients	4.21	V.H.LAD	3.28	M.LAD	3.42	H.LAD	3.62	H.LAD	3.64	H.LAD	3.50	H.LAD	3.22	M.LAD	3.35	M.LAD	3.36	M.LAD	3.50	H.LAD
Delivering products/services which reduce your clients’ costs	3.09	M.LAD	3.49	H.LAD	3.55	H.LAD	3.94	H.LAD	3.90	H.LAD	3.68	H.LAD	3.17	M.LAD	3.66	H.LAD	3.51	H.LAD	3.58	H.LAD
Attracting new clients/customers	3.22	M.LAD	3.24	M.LAD	3.14	M.LAD	3.75	H.LAD	3.73	H.LAD	3.38	M.LAD	3.35	M.LAD	3.42	H.LAD	3.23	M.LAD	3.40	M.LAD

Table 7: Continued

Sustainability Practices	Mean Score	Remark	M.S AKS N=113	Remark	MS BYS N=85	Remark	MS CRS N=112	Remark	MS DTS N=126	Remark	MS EDS N=114	Remark	MS IMO N=92	Remark	MS Ondo N=109	Remark	MS RIV. N=140	Remark	Combi ned MS N=980	Remark
Knowledge Strategies																				
Actively monitoring international best practice	3.27	M.L.AD	3.19	M.L.AD	4.93	V. H.L.AD	3.62	H.L.AD	3.67	H.L.AD	3.50	H.L.AD	3.26	M.L.AD	4.83	V.H.L.AD	3.31	M.L.AD	3.70	H.L.AD
Maintaining a formal system for transferring project learnings into our continuous business processes	3.87	M.L.AD	3.18	M.L.AD	3.36	M.L.AD	3.58	H.L.AD	3.66	H.L.AD	3.50	H.L.AD	3.09	M.L.AD	3.57	H.L.AD	3.19	M.L.AD	3.44	H.L.AD
Measuring how well our changes have worked	3.16	M.L.AD	3.35	M.L.AD	3.53	H.L.AD	3.63	H.L.AD	3.67	H.L.AD	3.56	H.L.AD	3.22	M.L.AD	3.46	H.L.AD	3.26	M.L.AD	3.43	H.L.AD
Relationship Strategies																				
Rewarding staff for maintaining networking linkages with strategically useful industry participants	3.51	H.L.AD	3.27	M.L.AD	3.47	H.L.AD	3.53	H.L.AD	3.56	H.L.AD	3.38	M.L.AD	3.09	M.L.AD	3.42	H.L.AD	3.25	M.L.AD	3.38	M.L.AD
Pursuing partnering on projects	3.18	M.L.AD	3.22	M.L.AD	3.51	H.L.AD	3.54	H.L.AD	3.53	H.L.AD	3.51	H.L.AD	3.26	M.L.AD	3.39	M.L.AD	3.34	M.L.AD	3.39	M.L.AD
Pursuing alliance projects	3.16	M.L.AD	3.30	M.L.AD	3.48	H.L.AD	3.57	H.L.AD	3.60	H.L.AD	3.45	H.L.AD	3.00	M.L.AD	3.31	M.L.AD	3.11	M.L.AD	3.34	M.L.AD
Level of Adoption of Organisational Innovativeness Among Firm in Niger Delta	3.17	M.L.AD	3.16	M.L.AD	3.37	M.L.AD	3.45	H.L.AD	3.47	H.L.AD	3.37	M.L.AD	3.21	M.L.AD	3.33	M.L.AD	3.17	M.L.AD	3.30	M.L.AD
Organisational Culture Practices																				
Power-distance: degree to which power is expected to be equally shared	3.11	M.L.AD	2.94	M.L.AD	3.31	M.L.AD	3.71	H.L.AD	3.69	H.L.AD	3.76	H.L.AD	3.13	M.L.AD	3.43	H.L.AD	3.17	M.L.AD	3.37	M.L.AD
Individualism - collectivism, degree to which individuals are encouraged to be integrated into groups	3.92	H.L.AD	2.83	M.L.AD	3.20	M.L.AD	3.45	H.L.AD	3.41	H.L.AD	3.45	H.L.AD	3.17	M.L.AD	3.36	M.L.AD	3.06	M.L.AD	3.30	M.L.AD
Performance orientation: degree to which rewards are encouraged for performance improvement and excellence	3.85	M.L.AD	3.04	M.L.AD	3.26	M.L.AD	3.48	H.L.AD	3.50	H.L.AD	3.44	H.L.AD	3.22	M.L.AD	3.18	M.L.AD	3.13	M.L.AD	3.33	M.L.AD
Level of Adoption of Organisational Culture Practices among Firm in Niger Delta, Nigeria	3.14	M.L.AD	2.96	M.L.AD	3.20	M.L.AD	3.47	H.L.AD	3.46	H.L.AD	3.46	H.L.AD	3.20	M.L.AD	3.22	M.L.AD	3.14	M.L.AD	3.25	M.L.AD

Table 7: Continued

Sustainability Practices	Mean Score Abs N=89	Remark	M.S AKS N=113	Remark	MS BYS N=85	Remark	MS CRS N=112	Remark	MS DTS N=126	Remark	MS EDS N=114	Remark	MS IMO N=92	Remark	MS Ondo N=109	Remark	MS RIV. N=140	Remark	Combi ned MS N=980	Remark
Corporate Governance:																				
Shareholders Right																				
Secure ownership registration	3.55	H.L.AD	4.00	H.L.AD	3.88	H.L.AD	4.53	V.H.L.AD	4.45	V.H.L.AD	3.99	H.L.AD	3.61	H.L.AD	4.09	H.L.AD	3.66	H.L.AD	3.99	H.L.AD
Shareholder input on certain key decisions is possible	2.28	L.L.AD	2.10	L.L.AD	2.24	L.L.AD	2.31	L.L.AD	2.40	L.L.AD	2.26	L.L.AD	2.27	L.L.AD	2.06	L.L.AD	2.20	L.L.AD	2.29	L.L.AD
Ownership rights of all shareholders are facilitated	2.21	L.L.AD	2.57	L.L.AD	2.27	L.L.AD	2.31	L.L.AD	2.35	L.L.AD	2.14	L.L.AD	2.34	L.L.AD	2.10	L.L.AD	2.36	L.L.AD	2.34	L.L.AD
Stakeholders in Governance																				
Legal and mutually established rights of stakeholders are respected	2.28	L.L.AD	2.66	M.L.AD	4.08	H.L.AD	2.45	L.L.AD	2.72	M.L.AD	2.20	L.L.AD	2.87	M.L.AD	2.14	L.L.AD	2.19	L.L.AD	2.57	L.L.AD
Performance-enhancing mechanisms for employee participation are permitted	2.31	L.L.AD	2.35	L.L.AD	2.33	L.L.AD	2.49	L.L.AD	2.59	L.L.AD	2.39	L.L.AD	2.83	M.L.AD	2.18	L.L.AD	2.28	L.L.AD	2.41	L.L.AD
Stakeholders have a right to access to timely, relevant, and reliable information on governance issues in which they have a right to participate	2.31	L.L.AD	2.55	L.L.AD	2.28	L.L.AD	2.49	L.L.AD	2.56	L.L.AD	2.57	L.L.AD	2.65	M.L.AD	2.28	L.L.AD	2.62	M.L.AD	2.49	L.L.AD
Transparency and Disclosure																				
Disclosure of Company objectives	3.25	M.L.AD	2.77	M.L.AD	2.33	L.L.AD	2.54	L.L.AD	2.59	L.L.AD	2.58	L.L.AD	2.48	L.L.AD	2.66	M.L.AD	2.85	M.L.AD	2.67	M.L.AD
Disclosure of Foreseeable risks	3.15	M.L.AD	3.02	M.L.AD	2.36	L.L.AD	2.63	M.L.AD	2.66	M.L.AD	2.51	L.L.AD	2.52	L.L.AD	2.79	M.L.AD	2.89	M.L.AD	2.73	M.L.AD
Disclosure of Issues regarding employees and other stakeholders	2.35	L.L.AD	2.65	M.L.AD	2.33	L.L.AD	2.58	L.L.AD	2.64	M.L.AD	2.57	L.L.AD	2.61	M.L.AD	2.41	L.L.AD	2.79	M.L.AD	2.57	L.L.AD
The Board of Directors																				
Board members act in the interest of the company and its shareholders	2.35	L.L.AD	2.61	M.L.AD	3.05	M.L.AD	2.72	M.L.AD	2.74	M.L.AD	2.63	M.L.AD	3.22	M.L.AD	2.78	M.L.AD	2.79	M.L.AD	2.76	M.L.AD
The board applies high ethical standards	2.33	L.L.AD	2.72	M.L.AD	2.27	L.L.AD	2.81	M.L.AD	2.77	M.L.AD	2.63	M.L.AD	3.22	M.L.AD	2.43	L.L.AD	2.94	M.L.AD	2.69	M.L.AD
The board takes into account the interests of other stakeholders	2.28	L.L.AD	2.95	M.L.AD	2.27	L.L.AD	2.72	M.L.AD	2.77	M.L.AD	2.63	M.L.AD	3.22	M.L.AD	2.39	L.L.AD	2.96	M.L.AD	2.71	M.L.AD
Level of Adoption of Corporate Governance among Firms In Niger Delta	2.40	L.L.AD	2.48	L.L.AD	2.26	L.L.AD	2.43	L.L.AD	2.49	L.L.AD	2.38	L.L.AD	2.60	L.L.AD	2.25	L.L.AD	2.52	L.L.AD	2.41	L.L.AD
Stakeholders Engagement																				
Opportunity risk examinations	2.87	M.L.AD	3.23	M.L.AD	3.36	M.L.AD	3.77	H.L.AD	3.87	H.L.AD	3.55	H.L.AD	3.22	M.L.AD	3.30	M.L.AD	3.26	M.L.AD	3.40	H.L.AD
Common understanding	2.66	M.L.AD	3.14	M.L.AD	3.01	M.L.AD	3.18	M.L.AD	3.23	M.L.AD	3.39	M.L.AD	3.22	M.L.AD	3.03	M.L.AD	3.31	M.L.AD	3.15	M.L.AD

Table 7: Continued

Sustainability Practices	Mean Score Abs N=89	Remark	M.S AKS N=113	Remark	MS BYS N=85	Remark	MS CRS N=112	Remark	MS DTS N=126	Remark	MS EDS N=114	Remark	MS IMO N=92	Remark	MS Ondo N=109	Remark	MS RIV. N=140	Remark	Combined MS N=980	Remark
Setting of targets for stakeholders	3.18	M.LAD	3.26	M.LAD	3.47	H.LAD	3.32	M.LAD	3.40	M.LAD	3.62	H.LAD	3.52	H.LAD	3.34	M.LAD	3.24	M.LAD	3.37	M.LAD
Level of Adoption of Stakeholders Engagement among Firms In Niger Delta	2.56	L.LAD	2.87	M.LAD	2.84	M.LAD	3.07	M.LAD	3.13	M.LAD	3.15	M.LAD	3.20	M.LAD	2.83	M.LAD	3.02	M.LAD	2.98	M.LAD
Transparency and Measurement																				
Information Collection Review	2.64	M.LAD	2.73	M.LAD	3.36	M.LAD	3.50	H.LAD	3.57	H.LAD	3.69	H.LAD	3.26	M.LAD	3.10	M.LAD	3.23	M.LAD	3.25	M.LAD
Mapping against Standards	3.00	M.LAD	3.29	M.LAD	3.61	H.LAD	3.49	H.LAD	3.59	H.LAD	3.56	H.LAD	3.35	M.LAD	3.50	H.LAD	3.54	M.LAD	3.45	H.LAD
Sample Site Visits	2.94	M.LAD	3.30	M.LAD	3.35	M.LAD	3.40	H.LAD	3.48	H.LAD	3.44	H.LAD	3.13	M.LAD	3.28	M.LAD	3.41	H.LAD	3.32	M.LAD
Level of Adoption of Transparency and Measurement among Firm In Niger Delta, Nigeria	2.50	L.LAD	2.54	L.LAD	2.93	M.LAD	3.08	M.LAD	3.14	M.LAD	3.14	M.LAD	3.02	M.LAD	2.80	M.LAD	2.92	M.LAD	2.91	M.LAD
Corporate Social Responsibility																				
Provision of Employment opportunities	2.76	M.LAD	3.00	M.LAD	3.09	M.LAD	3.13	M.LAD	3.16	M.LAD	3.12	M.LAD	2.96	M.LAD	2.96	M.LAD	2.98	M.LAD	3.03	M.LAD
Infrastructural Development	2.47	L.LAD	2.70	M.LAD	2.73	M.LAD	2.58	L.LAD	2.61	M.LAD	2.76	M.LAD	3.00	M.LAD	2.56	L.LAD	2.79	M.LAD	2.69	M.LAD
Human capital development	2.37	L.LAD	2.57	L.LAD	2.66	M.LAD	2.45	L.LAD	2.50	L.LAD	2.68	M.LAD	2.91	M.LAD	2.39	L.LAD	3.37	M.LAD	2.91	M.LAD
Level of Adoption of Corporate Social Responsibility among Firm In Niger Delta	2.46	L.LAD	2.49	L.LAD	2.43	L.LAD	2.39	L.LAD	2.41	L.LAD	2.85	M.LAD	2.80	M.LAD	2.33	L.LAD	2.76	M.LAD	2.55	L.LAD
Employment Practices																				
Training of personnel	2.12	L.LAD	2.41	L.LAD	2.54	L.LAD	2.95	M.LAD	2.95	M.LAD	2.96	M.LAD	2.70	M.LAD	2.51	L.LAD	2.64	M.LAD	2.75	M.LAD
Wages/salary induced motivation	2.13	L.LAD	2.58	L.LAD	2.15	L.LAD	2.41	L.LAD	2.37	L.LAD	2.59	L.LAD	2.74	M.LAD	2.28	L.LAD	2.74	M.LAD	2.66	M.LAD
Social dialogue	2.04	L.LAD	2.36	L.LAD	2.25	L.LAD	2.54	L.LAD	2.48	L.LAD	2.59	L.LAD	2.65	M.LAD	2.25	L.LAD	2.57	L.LAD	2.46	L.LAD
Level of Adoption of Employment Practices among Firm In Niger Delta	2.19	L.LAD	2.41	L.LAD	2.17	L.LAD	2.51	L.LAD	2.49	L.LAD	2.61	M.LAD	2.79	M.LAD	2.26	L.LAD	2.66	M.LAD	2.47	L.LAD
Protection of the Environment																				
Building designs, construction practices and technologies that are environmentally friendly and sustainable	3.13	M.LAD	3.42	H.LAD	3.52	H.LAD	3.50	H.LAD	3.57	H.LAD	3.56	H.LAD	3.48	H.LAD	3.44	H.LAD	3.57	H.LAD	3.48	H.LAD

Table 7: Continued

Sustainability Practices	Mean Score Abs N=89	Remark	M.S AKS N=113	Remark	MS BYS N=85	Remark	MS CRS N=112	Remark	MS DTS N=126	Remark	MS EDS N=114	Remark	MS IMO N=92	Remark	MS Ondo N=109	Remark	MS RIV. N=140	Remark	Combined MS N=980	Remark
Effective communication of sustainability and other environmental management issues among contractors, suppliers and other professionals engaged by the organisation	2.74	M.L.AD	2.73	M.L.AD	3.26	M.L.AD	3.23	M.L.AD	3.29	M.L.AD	3.37	M.L.AD	3.22	M.L.AD	3.03	M.L.AD	3.03	M.L.AD	3.10	M.L.AD
Standardized management systems such as ISO 14001 or Environmental Management Systems (EMS) in your organisation	2.30	L.L.AD	2.51	L.L.AD	2.47	L.L.AD	2.54	L.L.AD	2.59	L.L.AD	2.40	L.L.AD	2.56	L.LAD	2.44	L.L.AD	2.67	M.L.AD	2.58	L.L.AD
Level of Adoption of Protection of the Environment among Firm In Niger Delta	2.43	L.L.AD	2.29	L.L.AD	2.33	L.L.AD	2.57	L.L.AD	2.58	L.L.AD	2.58	L.L.AD	2.55	L.L.AD	2.34	L.L.AD	2.56	L.L.AD	2.51	L.L.AD
Level of Adoption of Sustainability Practices among Construction Firms in Niger Delta	2.71	M.L.AD	2.83	M.L.AD	2.82	M.L.AD	2.96	M.L.AD	3.04	M.L.AD	3.00	M.L.AD	3.02	M.L.AD	2.78	M.L.AD	2.93	M.L.AD	2.91	M.L.AD

V.L.L.AD – Very Low Level of Adoption, L.L.AD – Low level of Adoption, M.L.AD – Moderate Level of Adoption, H.L.AD – High Level of Adoption and V.H.L.AD – Very High Level of Adoption

5.4 Difference in the Levels of Adoption of Sustainability Practices among the Construction Firms in Niger Delta, Nigeria

Table 8 shows the result of Kruskal Wallis test that was conducted to test the hypothesis which states that there is no significant difference in the levels of adoption of sustainability practices among the construction firms based on location of the firms. The P-value of 0.001 is less than 0.05 significance level, hence the hypothesis was rejected. This indicates that there is a significant difference in the level of adoption of sustainability practices among the states in Niger Delta, Nigeria. This implies that construction firms operating in each of the states in Niger Delta did not record the same level of adoption of sustainability practices. In other words, the levels of adoption of sustainability practices by the construction firms varied from one state to another. This can be attributed to the level of enforcement of rules and regulations by the various state governments in ensuring that the construction firms carry out their activities in a more environmentally friendly manner and are socially responsible.

Table 8: Kruskal Wallis test for comparing the level of adoption of sustainability practices among the construction firms in Niger Delta, Nigeria

Level of Adoption of Sustainability Practices among the Construction Firms in Niger Delta, Nigeria	N	MEAN RANK	Chi-Square	D.F	P-Value	Decision @ 0.05 Sig. level
Abia	161	585.02	51.99	8	.001	Reject
Akwa Ibom	161	675.72				
Bayelsa	161	670.62				
Cross Rivers	161	794.00				
Delta	161	825.91				
Edo	161	811.28				
Imo	161	761.19				
Ondo	161	642.89				
Rivers	161	758.37				

5.5 Post Hoc Test on Level of Adoption of Sustainability Practices among the Construction Firms in Niger Delta, Nigeria

The result of post hoc test on level of adoption of sustainability practices among the construction firms in Niger Delta, Nigeria is shown in Table 9. Because of the significant level in the level of adoption of sustainability practices based on the locations, a post hoc test was conducted on the states using Bonferroni and Dunn test (Bonferroni-Dunn test) to determine the source(s) of the difference. The result of Bonferroni's multiple comparisons showed that Abia state contributed to the significant difference in the level of adoption of sustainability practices in Niger Delta. This was validated by Dunn test result, which showed that the other eight states have P-values greater than 0.05 significant level, except Abia state which has the P-value of .004. This implies that the level of adoption of sustainability practices in Abia state is significantly different from other states in Niger Delta, Nigeria.

Table 9: Post Hoc Test on level of adoption of sustainability practices among construction firms in Niger Delta, Nigeria

	(I) STATES IN NIGER DELTA	(J) STATES IN NIGER DELTA	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Bonferroni	ABIA	AKWA IBOM	-.1021	.06170	1.000	-.2998	.0955
		BAYELSA	-.1060	.06170	1.000	-.3037	.0916
		CROSS RIVERS	-.2528*	.06170	.002	-.4504	-.0551
		DELTA	-.3245*	.06170	.001	-.5222	-.1269
		EDO	-.2725*	.06170	.001	-.4702	-.0749
		IMO	-.2301*	.06170	.007	-.4278	-.0325
		ONDO	-.0688	.06170	1.000	-.2665	.1288
		RIVERS	-.2132*	.06170	.020	-.4109	-.0156
	AKWA IBOM	ABIA	.1021	.06170	1.000	-.0955	.2998
		BAYELSA	-.0039	.06170	1.000	-.2015	.1937
		CROSS RIVERS	-.1506	.06170	.531	-.3483	.0470
		DELTA	-.2224*	.06170	.012	-.4200	-.0248
		EDO	-.1704	.06170	.210	-.3680	.0272
		IMO	-.1280	.06170	1.000	-.3256	.0697
		ONDO	.0333	.06170	1.000	-.1643	.2309
		RIVERS	-.1111	.06170	1.000	-.3087	.0866
	BAYELSA	ABIA	.1060	.06170	1.000	-.0916	.3037
		AKWA IBOM	.0039	.06170	1.000	-.1937	.2015
		CROSS RIVERS	-.1467	.06170	.631	-.3444	.0509
		DELTA	-.2185*	.06170	.015	-.4161	-.0209
		EDO	-.1665	.06170	.254	-.3641	.0311
		IMO	-.1241	.06170	1.000	-.3217	.0736
		ONDO	.0372	.06170	1.000	-.1604	.2348
		RIVERS	-.1072	.06170	1.000	-.3048	.0904
	CROSS RIVERS	ABIA	.2528*	.06170	.002	.0551	.4504
		AKWA IBOM	.1506	.06170	.531	-.0470	.3483
		BAYELSA	.1467	.06170	.631	-.0509	.3444
		DELTA	-.0718	.06170	1.000	-.2694	.1259
		EDO	-.0198	.06170	1.000	-.2174	.1779
		IMO	.0226	.06170	1.000	-.1750	.2203
		ONDO	.1839	.06170	.105	-.0137	.3816
		RIVERS	.0395	.06170	1.000	-.1581	.2372
	DELTA	ABIA	.3245*	.06170	.000	.1269	.5222
		AKWA IBOM	.2224*	.06170	.012	.0248	.4200
		BAYELSA	.2185*	.06170	.015	.0209	.4161
		CROSS RIVERS	.0718	.06170	1.000	-.1259	.2694
		EDO	.0520	.06170	1.000	-.1456	.2496
		IMO	.0944	.06170	1.000	-.1032	.2921
		ONDO	.2557*	.06170	.001	.0581	.4533
		RIVERS	.1113	.06170	1.000	-.0863	.3090

Table 9: Continued

	(I) STATES IN NIGER DELTA	(J) STATES IN NIGER DELTA	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
	EDO	ABIA	.2725*	.06170	.001	.0749	.4702
		AKWA IBOM	.1704	.06170	.210	-.0272	.3680
		BAYELSA	.1665	.06170	.254	-.0311	.3641
		CROSS RIVERS	.0198	.06170	1.000	-.1779	.2174
		DELTA	-.0520	.06170	1.000	-.2496	.1456
		IMO	.0424	.06170	1.000	-.1552	.2400
		ONDO	.2037*	.06170	.035	.0061	.4013
		RIVERS	.0593	.06170	1.000	-.1383	.2569
	IMO	ABIA	.2301*	.06170	.007	.0325	.4278
		AKWA IBOM	.1280	.06170	1.000	-.0697	.3256
		BAYELSA	.1241	.06170	1.000	-.0736	.3217
		CROSS RIVERS	-.0226	.06170	1.000	-.2203	.1750
		DELTA	-.0944	.06170	1.000	-.2921	.1032
		EDO	-.0424	.06170	1.000	-.2400	.1552
		ONDO	.1613	.06170	.325	-.0363	.3589
		RIVERS	.0169	.06170	1.000	-.1807	.2145
	ONDO	ABIA	.0688	.06170	1.000	-.1288	.2665
		AKWA IBOM	-.0333	.06170	1.000	-.2309	.1643
		BAYELSA	-.0372	.06170	1.000	-.2348	.1604
		CROSS RIVERS	-.1839	.06170	.105	-.3816	.0137
		DELTA	-.2557*	.06170	.001	-.4533	-.0581
		EDO	-.2037*	.06170	.035	-.4013	-.0061
		IMO	-.1613	.06170	.325	-.3589	.0363
		RIVERS	-.1444	.06170	.699	-.3420	.0532
	RIVERS	ABIA	.2132*	.06170	.020	.0156	.4109
		AKWA IBOM	.1111	.06170	1.000	-.0866	.3087
		BAYELSA	.1072	.06170	1.000	-.0904	.3048
		CROSS RIVERS	-.0395	.06170	1.000	-.2372	.1581
		DELTA	-.1113	.06170	1.000	-.3090	.0863
		EDO	-.0593	.06170	1.000	-.2569	.1383
		IMO	-.0169	.06170	1.000	-.2145	.1807
		ONDO	.1444	.06170	.699	-.0532	.3420
Dunnett	ABIA	RIVERS	-.2132*	.06170	.004	-.3771	-.0494
	AKWA IBOM	RIVERS	-.1111	.06170	.336	-.2749	.0528
	BAYELSA	RIVERS	-.1072	.06170	.375	-.2710	.0567
	CROSS RIVERS	RIVERS	.0395	.06170	.990	-.1243	.2034
	DELTA	RIVERS	.1113	.06170	.334	-.0525	.2752
	EDO	RIVERS	.0593	.06170	.905	-.1045	.2231
	IMO	RIVERS	.0169	.06170	1.000	-.1470	.1807
	ONDO	RIVERS	-.1444	.06170	.111	-.3082	.0194

6. DISCUSSION OF FINDINGS

The mean scores ranging between 2.78 and 3.04 imply that the construction firms operating in each state of Niger Delta recorded moderate level of adoption of sustainability practices. The average mean score of 2.91 indicates that the overall level of adoption of sustainability practices among construction firms in Niger Delta is 'moderate level'. This study is in contrast with Waziri, Yusof and Osmadi (2015) who studied green construction practices and concluded that sustainable practices are slightly implemented at firm level in Nigeria. The P-value of 0.001 is less than 0.05 significance level, hence the hypothesis was rejected. This indicates that there is a significant difference in the level of adoption of sustainability practices among the states in Niger Delta, Nigeria. This implies that construction firms operating in each of the States in Niger Delta did not record the same level of adoption of sustainability practices. In other words, the levels of adoption of sustainability practices by the construction firms varied from one state to another. This can be attributed to the level of enforcement of rules and regulations by the various state governments in ensuring that the construction firms carry out their activities in a more environmentally friendly manner and are also socially responsible.

The mean ranks revealed that the construction firms operating in Delta state adopted sustainability practices more than firms operating in other States. However, the mean rank showed that firms operating in Abia State least adopted sustainability practices. Bonferroni's multiple comparisons showed that Abia State contributed to the significant difference in the level of adoption of sustainability practices in Niger Delta. This was validated by Dunnett test result, which showed that the other eight States have P-values greater than 0.05 significant level, except Abia state, which has the P-value of .004. This implies that that the level of adoption of sustainability practices in Abia state is significantly different from other states in Niger Delta, Nigeria. This study is in consonance with Cox *et al.* (2009), who posited that variations in locational context have an impact on the adoption and effectiveness of sustainability practices. It was argued that institutional and social structures of the states can affect the likelihood of sustainability practices being adopted and achieving the desired outcomes.

7. CONCLUSION AND RECOMMENDATION

This study evaluated the level of adoption of sustainability practices among construction firms in Niger Delta, Nigeria. It compared the level of adoption of sustainability practices among the construction firms operating in each of the states in Niger Delta, Nigeria. The findings from the study suggests that the mean scores range between 2.78 and 3.04, which by implication means that the construction firms operating in each state of Niger Delta recorded moderate level of adoption of sustainability practices. The average mean score of 2.91 indicates that the overall level of adoption of sustainability practices among construction firms in Niger Delta is 'moderate level'. The findings from the study also indicate that the mean ranks revealed that the construction firms operating in Delta State adopted sustainability practices more than firms operating in other States of Niger Delta region of Nigeria and that Abia State is the least adopted sustainability practices State.

This study concluded that level of adoption of sustainability practices among construction firms in Niger Delta is moderate. This indicates that construction firms in Niger Delta need to show more commitment to the adoption of sustainability practices in order to be environmentally friendly, economically viable and socially responsible. This study concluded that construction firms operating in each of the states in Niger Delta did not record the same level of adoption

of sustainability practices. It is concluded that construction firms operating in Abia state least adopted sustainability practices. Hence, this study concludes that firms' location have significant impact on the level of adoption of sustainability practices by the construction firms in Niger Delta.

This study recommends government should pass into law, legislations that would encourage the adoption of sustainability practices by the construction firms in Niger - Delta, Nigeria. This study also recommends that construction firms should improve on their level of adoption of sustainability practices in Niger Delta by increasing top management support, human resource management, employee empowerment, training and educating employees on sustainability practices and increasing the amount of resources allocated to sustainability.

REFERENCES

- Abdullah, A., Bilau, A. A., Enegbuma, W. I., Ajagbe, A. M., Ali, K. N. & Bustani, S. A. (2012), Small and Medium Sized Construction Firms Job Satisfaction and Evaluation in Nigeria. *International Journal of Social Science and Humanity*, 2(1): 35-40.
- Addis, B. and Talbot, R. (2001). Sustainable Construction Procurement: a Guide to Delivering Environmentally Responsible Projects, *CIRIA C571*, London, CIRIA.
- Akhakpe, I. (2012). Oil - environmental degradation and human security in the Niger - Delta region of Nigeria: Challenges and possibilities. *European Scientific Journal*, 8 (26): 77-92.
- Akindoyeni, A. (2012). "Transformation agenda and building production in Nigeria", 42nd National conference and annual general meeting of the Nigerian Institute of Building, Enugu.
- Al-Jamea, M. (2014). Towards Social and Cultural Sustainability in the Designs of Contemporary Saudi Houses. *Int J Sustain Hum Dev*, 2(1): 35-43.
- Barde, I.M and Tela, G. (2015). Corporate Social Responsibility and Financial Performance in the Nigerian Construction Industry, International Conference on Humanities, Literature and Management (ICHLM'15) Jan. 9-10, 2015 Dubai (UAE).
- Branco, M.C. and Rodrigues, L. (2006). "Corporate Social Responsibility and Resource Based Perspectives." *Journal of Business Ethics*, 69:111-132.
- Brundtland, G. H. (1987). *Our Common Future: Report of the World Commission in Environment and Development*, Oxford: Oxford University Press.
- Chambers (1993). *The Chambers Dictionary*. Chambers Harrap Publishers Ltd, Edinburgh.
- Chen, L. (2015). Sustainability and Company Performance: Evidence from the Manufacturing Industry. Linköping Studies in Science and Technology Dissertations No. 1698, Division of Production Economics Department of Management and Engineering Linköping University, SE-581 83 Linköping, Sweden.
- Cheng, B., Ioannou, I. and Serafeim, G. (2011). Corporate Social Responsibility and Access to Finance. HBS Working Paper Series 11-130

- Cox, A., Higgins, T., and Speckesser, S. (2009). *Management Practices and Sustainable Organisational Performance*. Dublin, Ireland: European Company Survey.
- Crowther, D. (2000a). *Social and Environmental Accounting*. London: Financial Times Prentice Hall
- Dania, A. A, Larsen, G.D. and Yao,R. (2013). Mainstreaming Sustainable Construction: Case Studies of an Indigenous and Multinational Firm in Nigeria, Working Paper Proceedings, Engineering Project Organization Conference Devil's Thumb Ranch, Colorado.
- D'Incognito, M., Costantino, N., and Migliaccio, G. C. (2013). Assessing the Influence of Cultural Issues on the Adoption of Life Cycle Management Tools. In S. Kajewski, K. Manley, and K. Hampson (Eds.), *Proceedings of the 19th International CIB World Building Congress*. Brisbane: Queensland University of Technology.
- Eccles, R., Ioannou, I., and Serafeim, G. (2012). The Impact of a Corporate Culture of Sustainability on Corporate Behavior and Performance. Harvard Business School Working Paper.
- Egbu, C.O. and Robinson, H.S. (2005). Construction as a Knowledge-Based Industry. In C.J. Anumba, C.O. Egbu and P.M. Carrillo, eds.
- Ekung, S. Ujene, A. Ebong, U. (2014). "Drivers of Corporate Social Responsibility within Construction Organization in Nigeria", *International Letters of Social and Humanistic Sciences*, 32: 14-25.
- Emmitt, S. and Gorse, C. (2003). *Construction Communication*. Oxford: Blackwell Publishing.
- Epstein, M. J. (2008). *Making Sustainability Work: Best Practices in Managing and Measuring Corporate Social, Environmental and Economic Impacts*: Berrett-Koehler Publishers.
- Federal Ministry of Environment Housing and Urban Development (2008). *Managing the Nigerian Environment for Sustainable Development: Challenges and Opportunities*, Abuja
- Foo, L.M. (2007). Stakeholder Engagement in Emerging Economies: Considering the Strategic Benefits of Stakeholder Engagement in a Cross-cultural and Geopolitical Context. *Corporate Governance*, 7(4): 379-387.
- Freeman, R. E., Harrison, J. S., and Wicks, A. C. (2007). *Managing for Stakeholders: Survival, Reputation, and Success*. New Haven, CT: Yale University Press, United States.
- Groves, R. M. (2006). Non Response Rates and Non Response Bias in Household Surveys. *Public Opinion Quarterly*, 70(5):646-675.
- Hillman, A. J. and Keim, G. D. (2001). Shareholder Value, Stakeholder Management, and Social Issues: What's the Bottom Line? *Strategic Management Journal*, 22(2): 125-139.
- Ijaiya, H. (2014). Challenges of Corporate Social Responsibility in the Niger Delta Region of Nigeria, Afe Babalola University: *Journal of Sustainable Development Law and Policy*, 3(1): 60-71.

- Ijigah, E. A., Jimoh, R. A., Aruleba, B. O. and Ade, A. B. (2013). An Assessment of Environmental Impacts of Building Construction Projects, *Civil and Environmental Research*, 3(1): 93-104.
- Ikediashi, D.I., Ogunlana, S.O., Oladokun, M.G. and Adewuyi, T.O. (2012). Assessing the Level of Commitment and Barriers to Sustainable Facilities Management Practice: A case of Nigeria, *International Journal of Sustainable Built Environment*, 1: 167–176
- Inkoom, E. E. (2013). Sustainability Adoption in Construction Organizations – An Institutional and Strategic Choice Perspective, A Thesis Submitted for the Degree of Master of Science (Building) Department of Building National University of Singapore
- John, C.H.S., Cannon, A.R. and Pouder, R.W. (2001). "Change Drivers in the New Millennium: Implications for Manufacturing Strategy Research", *Journal of Operations Management*, 19(2): 143-160.
- Jones, M. and Saad, M., (2003). *Managing Innovation in Construction*. London: Thomas Telford.
- Kaplan, R., and Norton D. (2008). *Execution Premium: Linking Strategy to Operations for Competitive Advantage*. Harvard Business School Press.
- Kazaz A, Manisali E, Ulubeyli S. (2008). Effect of Basic Motivational Factors on Construction Workforce Productivity in Turkey. *J Civil Eng Manage*. 14:95–106.
- Kheni, N.A and Akoogo, M.A. (2015). Determinants of Sustainable Construction Practices in Ghana Using Structural Equation Modelling. *Journal of Sustainable Development*; 8(3): 67-78.
- Klang, A., P.-A. Vikman and H. Brattebo (2003). “Sustainable Management of Demolition Waste, an Integrated Model for the Evaluation of Environmental, Economic and Social Aspects.” *Resources, Conservation and Recycling* 38 (4): 317-334.
- Linnenluecke, M. K., and Griffiths, A. (2010). Corporate Sustainability and Organisational Culture. *Journal of world business*, 45(4): 357-366.
- Nwokoro, I and Onukwube, H. (2011). Sustainable or Green Construction in Lagos, Nigeria: Principles, Attributes and Framework, *Journal of Sustainable Development*, 4(4): 1913-9071
- Odoemene, A. (2011). Social Consequences of Environmental Change in the Niger Delta of Nigeria. *Journal of Sustainable Development*, 4 (2): 123-135.
- Ogbor, J. (2001). Critical Theory and the Hegemony of Corporate Culture. *Journal of Organizational Change Management*, 14: 590-608.
- Parkin, S. (2000). Context and Drivers for Operationalising Sustainable Development, *Proceedings of ICE*, 138: 9-15.
- Porter, T. B. (2008), Managerial Applications of Corporate Social Responsibility and Systems-Thinking for Achieving Sustainability Outcomes, *Systems Research and Behavioural Science*, 25: 397- 411.

- Quintas, P. (2005). *The Nature and Dimensions of Knowledge Management*. In C.J. Anumba, C.O. Egbu and P.M. Carrillo, eds. *Knowledge Management in Construction*. Oxford: Blackwell Publishing. pp.10-28.
- Saroop, S. H. and Allopi, D. (2014). Developing Eco Sensitive Infrastructure Solutions with the use of Sustainability Criteria. *International Journal of Science and Technology*, 3(2): 121-126.
- Selznick, P. (1948). "Foundations of the Theory of Organisation", *American Sociological Review*, 13(1): 25-35.
- Sharma, S. (2002). *Research in Corporate Sustainability: What really matters*: Edward Elgar, Cheltenham.
- Sommerville, J. and Craig, N. (2006). *Implementing IT in Construction*. Oxford: Taylor and Francis.
- Suliman, L. Kh. M., and Abdelnaser, O. (2009). Sustainable Development and Construction Industry in Malaysia, *Economic, Social, Political and Cultural Problems of the Future Society*, 10: 76-85.
- Thwala, D. W., Ajagbe, A. M., Enegbuma, W. I., Bilau, A. A. & Long, C. L. (2012), Sudanese Small and Medium Sized Construction Firms: An Empirical Survey of Job Turnover. *Journal of Basic, Applied Scientific Research*, 2(8): 7414-7420.
- Trong Tuan, L. (2012). Behind Knowledge Transfer. *Management Decision*, 50(3): 459-478.
- Ujene, A.O. (2014). Integrating Environmental Priority Concerns in Building Planning and Production in Niger Delta, Nigeria, *Journal of Architecture, Planning and Construction Management*, 4 (2): 36-56.
- Waziri, A.G. Nor' Aini Yusof, N. and Osmadi, A. (2015). Green Construction Practices (GCP) Implementation in Nigeria: How Far So Far? *Advances in Environmental Biology*, 9(5): 84-86.
- Wong, L., and Avery, G. C. (2009). Transforming Organisations towards Sustainable Practices. *International Journal of the Interdisciplinary Social Sciences*, 4(1): 397-408.
- World Business Council for Sustainable Development (WBCSD), (2002). "Sustainable Development Reporting Striking the Balance.
- Yamane, T. (1967). *Statistics: An Introductory Analysis*, 2nd Ed., New York: Harper and Row.