A CONCEPTUAL FRAMEWORK FOR ETHICAL SOURCING OF CONSTRUCTION MATERIALS IN NIGERIA

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The construction industry has been noted to have impacts on the ecosystem and human survival. On the positive side, it has provided humans with basic infrastructure not limited to buildings, dams and roads. However, there are negative impacts of human activities on the environment such as pollution, waste generation, resources depletion, global warming and climate change. In addition to these, is the high rate of energy consumption resulting in the loss of biodiversity. This has increased the interest over the way countries achieve their development targets with respect to sustainable development. On the review of peer group studies, there is a dearth of literature relating to ethical sourcing of materials in the construction industry particularly in developing countries. The question is therefore how can an ethical sourcing framework be used to source construction materials in a sustainable manner? As such, the research studied materials sourcing in the Nigerian construction industry with a view to improve sustainability practise. The paper discussed the conceptual framework for ethical sourcing of construction materials. The conceptual framework is expected to improve sustainability practices in the Nigerian construction industry.

Keywords: corporate social responsibility, ecological footprint, ethical sourcing, sustainability reporting

INTRODUCTION

The construction industry often lays the bedrock for any activity to be carried out ranging from shelter, roads, bridges, production and dams. The construction industry it is often adjudged a large employer of labour ranging from un-skilled, semi-skilled to skilled. Globally, activities in the construction industry have often been criticised for not been sustainable. The negative impacts of the activities in the construction industry has been documented by (Murray and Dainty, 2009; Loosemore and Phua,

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2011; Dania *et.al,* 2013). The characteristics and challenges in developing countries are different from developed countries. According to Berardi (2013) developing countries demand for infrastructure and amenities, makes it imperative to implement sustainable construction practices. Dania *et al.,* (2014) observed that there is no framework that guides developing countries in Africa to achieve sustainability particularly for the construction industry. Luciana (2007) noted that the African countries including Nigeria have been touted as the next world economic hub, creating the need for sustainability practices in the continent. This will put more pressure on the natural resources base in the continent. Not only that, Ofori (1998) and du Plessis (2007) believed the characteristics and challenges in developing countries massive deficit in housing and infrastructure, frail institutional capacity of government, rapid growing population, social injustice and unsteady political environment. These factors might be the reason why successes in sustainability has been limited in developing countries. But du Plessis (2007) and Dania *et.al,* (2013) believed that developing countries need to see this as an opportunity to learn from the mistakes made by their developed counterparts to source, transport, produce and use materials ethically to achieve sustainable development. Ebohon and Rwelamila (2001) believed that the construction industry happens to be the foremost natural resources consumer, which significantly contributes to environmental disasters, global warming as well as harm to flora and fauna. Furthermore, Jacob *et.al,* (2014) submitted that the extraction of materials for the construction industry is weighing heavily on the environment and causing social problems. Moir and Carter (2012) avowed the need for a suitable framework to achieve sustainability in materials sourcing for the construction industry. The questions to be answered in this paper is can an ethical sourcing framework be used to source construction materials in a sustainable manner? The paper discusses the conceptual framework for studying ethics in materials sourcing particularly for Nigeria construction industry.

LITERATURE REVIEW

Sustainability in the construction industry

Sustainable construction activities in the built environment are believed to be a rejoinder to calls from different quarters to conduct activities sustainably. The most subscribed view of sustainable development comes from The World Conference Environment and Development's 1987, which puts it as “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Ding (2005) views sustainable construction as a rejoinder to sustainable development. The implementation of sustainability practices will revamp activities in the construction industry positively (Moir and Carter, 2012). Mosaku (2015) defined sustainable construction as " 'maintaining a delicate balance between the human needs to improve the lifestyles and a feeling of well-being on one hand and on the other hand preserving natural

resources and ecosystem on which the present and the future generations depend". The varying negative impacts of the construction industry on the environment as noted by Watuka and Aligula (2003) includes; natural resource depletion, energy utilisation, water, air pollution and also large generation of material waste.

Sustainable construction aims to ensure balance and harmony between various human activities and the ecosystem (Agenda 21, 2001). Pearce *et.al.,* (2005) believed that with respect to sustainability for construction materials, attention should focus on approaches that minimizes the consumption of energy, derivation of maximum satisfaction and reducing the occurrences of environmental damages.

du Plessis (2014) believed that the current global sustainability effort is only peripheral and will not have much impact on achieving a sustainable built environment. Hence the need to develop research questions in areas such as social-ecological structures, relevant systems model, adaptive strategies for climate change, resilience management, human behaviour and ethics.

The Nigeria Construction industry

The construction industry in Nigeria is pivotal for the country`s intended development, since it provides the basic facilities needed by humans for growth and survival. The idea of project development is often conceived without having consideration for a balance between economic, social and environmental factors in Nigeria (Mosaku, 2015). Akindoyemi (2012) submitted that stakeholders' demands for the sustainability practices in the Nigerian construction industry materialized after the organisation of a sustainability summit and the formation of a Green Building Council specifically to suit the Nigeria construction sector. Dania *et.al.,* (2013) concluded that the level of sustainability implementation in the Nigeria construction sector is below expectations. Alabi (2012) posits that the reasons for poor sustainability implementation in the Nigeria construction includes: the lack of appropriate regulation to promote sustainability practices, limited commitment to the economic benefits of sustainability, stakeholders' commitment is lacking, inadequate understanding of sustainable construction in the industry and the low desire to construct sustainably.

du Plessis (2007) submitted that the following condition must be met for the construction industry in developing countries to be sustainable:

I. There should be a synergy between the various stakeholders that exist in the construction industry.

II. The need for a balance between technology enablers, value system enablers and institutional system enablers.

III. The construction industry should be competent and proactive.

Table 2: Sustainable construction enablers in developing countries

Time	Technological	Institutional	Values
Immediate	Benchmarking & assessment	Clarified roles and responsibilities	Mapping the route to change
	Knowledge system & data-capturing	Education	Understanding the drivers
		Advocacy & awareness	Re-evaluating heritage
		Cooperation and partnership	
Medium	Technologies to mitigate impact	Linking research to implementation	Develop a new way of measuring value and reward
		Develop regulatory mechanisms	Develop code of conduct
Long term	Technologies of the future	Strengthening implementing mechanisms	Corporate social reporting
	Changing the construction process	Using institutions as drivers	
		Regional centres of excellence	

(Source: du Plessis, 2007)

Climate change

For over twenty years, the world has recognized the need to establish systems to regulate climate change, unfortunately, limited much success have been recorded. The Intergovernmental Panel on Climate Change (IPCC, 2013:2) report stated that the "Warming of the climate system is unequivocal, and since the 1950's, many of the observed changes are unprecedented over decades to millennia". The report attributed human activities including the construction industry as the major causes of climate change. The report further warned that the impact of climate change will continue if the current generation does not implement measures to reduce this trend. Evident changes in climate include persistent temperature rise, irregular rainfall pattern which increases the risk in drought in sub-Sahara Africa resulting in famine, while the melting of icebergs is linked to flooding (du Plessis, 2014).

Other indications of climate change also include the amount of high carbon dioxide (CO2) released into the environment. Currently, the CO2 equivalent concentrations in the atmosphere stands at 478ppm (MIT, 2013) however, du Plessis (2014) recommended that CO2 concentration should be kept back at 475ppm. This would lessen the effect of climate change on the environment by cutting the down the various greenhouse gases emitted from materials sourcing stage, transportation and production stage of building construction materials. Carpenter (1994) believed that the need for uprightness in the extraction process of natural from the earth crust is key to achieve sustainable development. The industrial and production of construction materials utilises large amounts

of energy and emits a lot of CO2 into atmosphere as illustrated in Table 2 below.

Table 2: Industrial and Process activity sources of global CO_2 emissions annually

Fossil fuels process	Number of sources	Emissions (MtCo2yr-1)
Power	4,942	19,539
Cement production	1,175	932
Refineries	638	798
Iron and steel industry	269	646
Petrochemical industry	470	379
Oil and gas processing	-	50
Other sources	90	33
Total	7584	13375

Adapted from: Metz *et al.,* (2005)

RESEARCH METHODOLOGY

The desktop methodology approach was employed for the research, where a review of related literature from journals, conference papers, policies and guidelines and books was carried out. The process was carried out by systematically reviewing journals from International Journal for Social, Behavioural, Education, Economics, Business and Industrial Engineering, Journal of Organization and Environment among others.

The review approach adopted is identical to the works of Saidu and Shankantu (2016); Mensah *et al.* (2014) and Tang *et al.,* (2010) employed in their studies. The study espoused the procedures below to gather papers relevant to the study:

i. Examination of title and abstract of relevant published materials

ii. Finding keywords on many online search engines not limited to Science Direct, Business Sources Premier, Emerald Database and Taylor and Francis.

iii. Further abstract checks of relevant materials downloaded to determine important materials.

iv. Narrative review of the relevant materials to explain the current level of approaches in sourcing materials ethically in the construction to add to existing knowledge.

v. Selecting relevant themes that appear from the set of materials and making relevant conclusions.

CONCEPTUAL FRAMEWORK FOR ETHICAL SOURCING OF CONSTRUCTION MATERIALS

The literature reviewed gave a guide for constructs to be included in the conceptual framework. A concept is a mental picture for a course of an action and provides a basis for commencing a research work. The conceptual framework comprises of a minimum of two interconnected plans, in order to elucidate an event systematically. It states the researchers view with respect to the research problems. Conceptual frameworks also illustrate the correlation that exist between key variables related to the research. Again, a conceptual framework is a pointer to research methodology process. Saidu and Shankantu (2016) believed a conceptual frame could emerge from the modification and adoption of similar models used in previous studies. Waheed et. al., (2009) puts forwards that a framework for sustainable development should consist of a conceptual model that brings forward and classifies parameters and indices that will be measured.

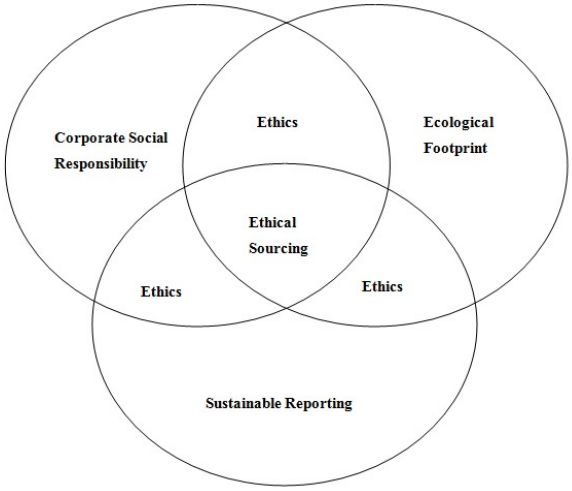

Figure 1. Conceptual framework for ethical sourcing of construction materials

CORPORATE SOCIAL RESPONSIBILITY

The pivot position occupied by the construction industry economically makes the industry important to any nation. Construction processes engages the services of skilled, semi- skilled and skilled personnel for project delivery not limited to the contractors, material producers and professional amongst others. Due to population growth and infrastructure expansion, the construction industry has been faced with sustainable development challenges relating to economic, environmental and social issues (Shen *et al.,* 2010). Teo and Loosemore (2003) noted that there has been more focus on the construction industry to operate sustainably in line with the sustainable development goals. Zhao *et al.,* (2012) noted that the public outcry by various stakeholders at the construction companies' mode of operation motivated companies to adopt a new strategy to redeem their image such as corporate social responsibility. Ritz and Ranganathan

(2001) submitted that stakeholders' demand for more disclosures not relating to financial performance from organisations on social environmental stewardship is now the order of the day. Moneva *et al.,* (2007) believed that when an organisation imbibes into its culture the commitment to social and ethical moral and values will enable such organisation to draw and retain the good employees, enhanced overall productivity and evading litigations among other benefits. Zhao *et al.,* (2012) believed that companies can show their commitment to cooperate social responsibility by publishing results and reports associated with reductions in pollution to air, water and land, release of toxic waste, carbon emissions and energy. According to Porter and Kramer (2006) organisations can demonstrate their commitment to cooperate social responsibility obligation when such organisations conduct business ethically and imbibe sustainability principles in their conducts. Jones *et al.,* (2006) stated that when organisations in the construction sector embrace ethical behaviour such as corporate social responsibility ideas might be an advantage over other organisations when bidding for construction projects.

ECOLOGICAL FOOTPRINT

The construction industry utilizes resources and energy both finished and semi-finished during construction process. Wackernagel and Rees (1996) defined the ecological footprint (EF) as "the total amount of ecologically productive land required to support the consumption of a given population in a sustainable way". Van *et al*., (2000) believed that ecological footprint should cover six (6) aspects namely: agricultural land, forest, fish, carbon and construction land area. World Business Council for Sustainable Development (2009) submitted that construction activities use up 50% of raw materials available on earth for various projects and these projects also requires 40% energy for daily operation. Again, Tam (2006) noted the unsuitable use of water, land and high pollution level in the construction industry. Resources consumption cuts across developing and developed countries leading to large amounts of materials waste. Activities in the construction industry in China adds to about 40% of total amount of waste generated in China, reaching an all-time high level of 300 million tonnes in 2010 (Wang *et al.,* 2010). Zhao et al., (2012) puts forward the resources consumption pattern in United Kingdom (UK) to be 420 million tonnes and generating 10% waste during the process. WBCSD (2009) linked the high energy consumption level to increase in population and economic growth and wasteful energy use pattern in developed nation. Ecological footprints involve stating both direct and indirect human materials demand for renewable resource production and use and evaluate these with the natural resources (Monfreda *et al*., 2004)

SUSTAINABILITY REPORTING

The Global reporting initiative (2006) puts forward that sustainability reporting intends to reveal to both the internal and external stakeholders an organisation`s commitment to sustainable development goals. Sustainability reports might be in various platforms such as online disclosure, disclosure in annual report or separate sustainability report of organisations (Zuo *et.al*, 2012). KPMG (2008) highlighted the drivers for sustainability reporting to includes;

- Organisations effort to meet stakeholders' need;
- Satisfying relevant laws, regulations and codes;
- Comparing an organisation current practices with other practices
- Performance measure and
- Practices to forestall stakeholders' wrath.

Adams and McNicholas in their study observed that the challenges to sustainability reporting are the lack of clear understanding on how to incorporate sustainability reporting efforts with the tactical planning for making important decisions and lack of knowledge to incorporate stakeholders in the reporting method.

Lankoski`s (2009) research on the benefits of sustainability reporting with the top executives of large companies submitted that reporting their companies' effort on environmental and social responsibility has improved their revenues and other profit lines.

Some challenges to sustainability reporting in the construction exist which has limited sustainability development goals. Maclaren (1996) believed lack of understandable and direct method for sustainability reporting is a barrier to sustainability. Studer *et al.,* (2005) noted the following as barriers to sustainability reporting:

- Deficient statutory legal requirement for sustainability reporting;
- Low motivation from the top ranked managers and
- Nonchalant attitude of stakeholders towards sustainability reporting;

ETHICAL SOURCING

Activities in the construction industry often come under scrutiny due the various impact on the environmental, supply chain, employee remunerations and benefit and inducement and fraud (Glass et al., 2014). This calls for a rethink from the current practice for sustainability in the construction industry mainly by considering ethics in the industry. Materials sourcing operation have varying degree of negative impact on the environment. The process of mineral resources extraction from the earth crust and production disturb the earth crust and result to loss of biodiversity (Gyang and Ashano, 2009). Gubbay (2003) noted that the

impact of sand dredging for construction activities destroys the environment. Efforts to restore the environment back into its original state requires a lot of time, resources and remediation. Quarrying activities release harmful total suspended particles of size below 50 μm which affects the air quality (Bada et al. 2013). This causes respiratory and cardiovascular diseases where it destroys the lung tissues and may result to lung cancer over a long period of time for residents living around the quarry site (Abdul-Wahab et al., 2013). There is the urgent need for global commitment to improve on activities and processes that contributes to climate change. Anand et al., (2006) submitted that cement production utilises considerable amounts of energy from the process of raw materials sourcing, transportation of raw materials to the production stage. The process contributes to approximately 20% of the global human CO2 emission (Anand et al., (2006)).

A study by Hansen and Treue (2008) revealed that about 90% of timber sourced in developing countries and particularly in West African countries including Nigeria is not sourced ethically. Efforts to ensure forest products are sourced ethically have been championed by countries that consume this product, by setting up relevant local and international programs to promote sustainability. However, the countries that supply the product have been left out of these efforts (Hansen and Treue, 2008). The lack of commitment from countries particularly in Tropics that supply timber may be the reason why significant achievement has not been recorded globally. Oborien (2005) noted that the unethical practices in stone quarry operations on the Iyuku community in Edo state Nigeria caused harmful impact to the social, environmental and economical livelihood of the inhabitant. As illustrated by Glass et al., (2012) the global uptake of ethical sourcing practices of construction materials is its infancy in the United Kingdom which is a developed country. OECD (1999) noted that material sourcing, transportation and production exert a lot of pressure on the environment resulting to devastation of environment, air, water and soil pollution and emission of dangerous substances not limited to NHX, SO2 and Co2. Raw materials and natural resources needs in Nigeria will increase due to the expanding middle class and the government ban on the importation of goods that can be manufactured locally. The implication of this is that more pressure will be on the environment to provide the needed natural resources to drive the manufacturing industries in Nigeria. Hence the critical need for ethical behavioural change on resources consumption pattern due to the earlier highlighted challenges to the continued survival of humans, plants and animal That might be the reason why Kabir et al., (2014) advocated for a framework for ethical sourcing of construction in Nigeria that integrates human wellbeing, health, safety and environmental considerations across the material supply chain. Ethical sourcing of construction will involve corporate social responsibility, sustainability reporting and ecological footprints.

CONCLUDING REMARKS

The study has shown the negative impact that the construction industry has on the environment. It further gives an insight into resources and energy consumption pattern. Again, it brings forward the current efforts made to improve sustainability practices regarding materials sourcing in the construction industry. Hence, the need of a framework for ethical sourcing of construction material is obvious. The framework is expected to improve sustainability practices, were construction materials will be sourced ethically.

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A CONCEPTUAL FRAMEWORK FOR PROMOTING ECONOMIC GROWTH IN CRUDE OIL DEPENDENT ECONOMIES - A MODEL FOR NIGERIA

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Many countries are currently faced with adverse economic challenges. The situation is more pronounce on economies that solely depend on crude oil. However, among the countries, those that adopt flexible managerial policies cope better under these dwindling economic conditions. The study aims at developing a conceptual framework that can depict how economic challenges of crude oil dependent economies *(CODE)* can be improve through deliberate intervening and moderating measures. The method adopted was based on Baron and Kenny casual steps approach. It was observed that *CODE* countries employed different strategic policies in overcoming current economic challenges especially when prices of crude oil collapse in the global market. The proposed framework was developed based on Big Push theory and Causal theory, in conjunction with the concept of Baron and Kenny. The framework takes into account the different strategic policies used by these countries and considered how diversification and innovativeness (mediating measures) can promote better economic growth alongside effective and efficient managerial system (moderating measures) which ultimately can lead to more efficient resource management hence, a growing sustainable economy especially in a country like Nigeria where there are other abundant resources that can support the economy.

Keywords: Conceptual Framework, economy, intervening measures, moderating measures

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INTRODUCTION

Oil dependent economies in the whole world are seriously affected by the continuous falling of oil prices. According to Meyer (2016) the countries that are mostly affected include Venezuela (oil account for 96% exports and more than 40% revenues of the government), Libya (energy sector accounting for 65% and 95% of government revenue), Russia (oil and gas account for 68%), Angola (oil industry account for 50% and more than 70% of government revenue), and Kuwait (relies on oil for more than 50% and 100% of government revenue), but these countries are politically unstable, and becoming more so with falling oil prices. Ekong and Ebong (2016) has also stated crude oil prices, stock market movement, and the economic growth have a long term and sustainable equilibrium relationship. Therefore, it means they are affected by the distributions in the prices of the crude oil. Also, Callen, Cherif, Hasanov, Hegazy, and Khandelwal (2014) stated that Gulf Cooperation Council (GCC) economies solely rely on oil where public and private sector were supported by it. However, with the present dwindling in the oil revenue, economic diversification is important, because it would reduce exposure to volatility and uncertainty in the global oil market. Furthermore, oil covers 70 percent of Saudi Arabia government revenue and it is the major employer for the Saudi workforce (Brew, 2016). But it appears Saudi Arabia is committed to make a major economic change as stated by crown prince Muhammad bin Salman, whereby the country would begin its transmission to an "oil-less" economy through an IPO of Saudi Aramco (Brew, 2016). It means Saudi Arabia have started diversifying their economy.

In addition, Ghana officially became an oil exporting nation in 2010, where it raises expectations and hopes for better Ghana, but to avoid bad management and corruption, sovereign wealth funds was proposed as a channel of managing the incoming revenues and economic stability account which will serve as a buffer in stormy times (Alagidede and Akpoza, 2015). The study did not suggest the way of improving the economy of Ghana through the introduction of certain factors as mediator or moderator, but only proposed ways of saving funds for future usage. Similarly, Hartwick and Olewiler (1986) consider the economics of natural resources as renewable and non-renewable resources, but did not consider the problems associated with the fall in price of crude oil that mostly affect oil producing and exporting countries (OPEC). Breton et. al. (2006) also proposed innovative approach to the management of coastal resources in the Caribbean states. The approach comprises the resources users, collaborating with government to manage the resources and mitigating common problems of resource overuse or misuse. The study did not consider diversification of the coastal resources for enhancing revenue generation and well-being of the community.

A policy framework for managing oil resources which involves market, state, and community was established by Obeng-Odoom (2016). Whereby, oil sector must run along market principles, state involvement must

systematically decline over time, and community must be engaged, but not put in charge. The study did not consider cost-effect relationship among the variables. Likewise, Obeng-Odoom (2014) presents various notions about how the relationship between the oil and gas wealth of African countries, and the record of their human development which are seen in terms of the "resource curse" doctrine. The study assesses the impact of the oil industry on the twin-city of Skondi-Takoradi in terms of land, livelihood, capital, and governance. Diversification and cost-effect of the oil industry were not considered in the study. However, Amoako-Tuffour (2016) suggested ways of saving revenues in case of uncertain future revenue generation, through establishing sovereign wealth funds (SWFs) with three components each with a clear savings objective: for future generations, for budget smoothening buffers, and for public infrastructure investment. But, the study did not consider mediator and moderator effect on the diversification of the resources.

Concept of Economic Growth

Economic growth has been viewed as the increase in the inflation-adjusted market value of the goods and services produced by an economy over time and conventionally measured as the percent rate of increase in real gross domestic product, or real GDP, usually in per capita terms. Since economic growth is measured as the annual percent change of gross domestic product (GDP), it has all the advantages and drawbacks of that measure. While labour efficiency has been a major issue of consideration in relation to economic growth, Krucher (2016) have analysed the contribution of labour efficiency as a dominant factor over technology on the issue. However, is very important for the ODEC to think on how to use the following economic theories.

The big push

The *Big Push* theory suggests that countries needed to jump from one stage of development to another through a virtuous cycle, in which large investments in infrastructure and education coupled with private investments would move the economy to a more productive stage, breaking free from economic paradigms appropriate to a lower productivity stage. This phenomenon was studied for growth in Sub-Saharan Africa by Abuzeid (2009).

Schumpeterian growth

Schumpeterian growth is an economic theory that explains growth as a consequence of innovation and a process of creative destruction that captures the dual nature of technological progress: in terms of creation, entrepreneurs introduce new products or processes in the hope that they will enjoy temporary monopoly-like profits as they capture markets. In doing so, they make old technologies or products obsolete. In another example, societies that emerged in colonies without solid native populations established better property rights and incentives for long-term investment than those where native populations were large. Aghion (2002) examined the relation of this theory and the dynamics of income inequality and the US and UK.