

# Sustainability Accounting and Sustainable Development in Nigeria

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## Abstract

Sustainability accounting is a subset of financial accounting that encapsulated social, economic, and environmental accounting (EA). The disclosures of these nonfinancial information provoke externality effect of human existence. The human existence is predicated on the good ecological conditions, but, negative externality of corporate businesses activities have one way or other affected humanity in divergent areas. Hence, the study focuses on the curiosity of sustainability accounting on the survival of human existence that is entrenched in sustainable development goals. The study employs statistical tools like descriptive statistics, correlation, multivariate and panel data regression to dissect the data gathered. The result reveals that the proportion of the disclosures of water, biodiversity, emission and compliance with environmental/ecological laws and regulation are minute and that have negative externality of the human development index which proxy for sustainable development.

**Keyword:** Human Development Index, Multivariate Regression, environmental accounting Sustainability Accounting, Sustainable Development.

**JEL Codes:** Q3, E2

## 1. Introduction

The adverse environmental hazard affects sustainable development and economic development of any society; it has become a matter of great public concern all over the world of environmental pollution of industrial hubs. However, Environmental costs and responsibilities are extensively growing as the world is becoming more environmentally cognizant. Corporate firms are being held more liable and answerable to environmental degradations of the society. Companies are therefore gradually becoming more aware of the societal and environmental liabilities and externalities relating to their operations and products (Environmental Protection Agency (EPA), 2000). These liabilities and externalities comprise the influences on the natural environment which are conveyed through the three principal agents: soil, water and air. The financial impacts are largely more often represented in the image of corporate firms and audited financial reporting (Goodstein, 2002). In addition, various stakeholders are ready to pay extra in favor of a product that is ecologically friendly and complied with current sustainable development goals. Sustainability accounting is a subsection of financial accounting that encapsulated environmental, social, and economic accounting. In this tripartite nature of sustainability accounting, EA is been considered herein the study. Hence, the study is exploring and dissecting sustainable development goals vis-à-vis environmental accounting (EA). It can therefore, not be denied that sustainability disclosure through EAD is of paramount importance today.

Howes (2002) defined EA as the invention, examination and employ of monetarized environmentally associated information so as to advance communal environmental and economic performance. To Howes (2002), environmental accounting makes the linkage between environmental and economic performance more visible. It assists in ensuring environmental preservation is incorporated within an organization. Also, Cornnor (2006) asserted that

“environmental accounting is any form of accounting involving the compilation, recording, and exposure of internal and external information about the monetary and non-monetary impact of organizational actions upon individuals, society and more generally on the physical environment”. EA is also denoted as Green Accounting, which deals with disclosures of information (financial and non-financial or quantitative and qualitative information) on carrying out their Corporate Social Responsibilities (CRS) to their host communities. It therefore serves as a pillar for CSR. It involves that companies are not focusing on making profit alone but restoring the earth to its green state and also taking responsibility for the environmental degradation caused by their activities by catering or providing for the host communities. Parameters in measuring these financial effects can be addressed by using environmental assessment and accounting techniques.

The practice in making use of natural resources is fundamental to economic improvements which lead to sustainable development and not lacking of environmental consequences as linkable to the environmental/ecological dreadful conditions and atmospheric greenhouse gasses experience in Nigeria

*Sustainable development (SD) connotes Our Common Future, that sustainable development is development that “meets the needs of the present without compromising the ability of future generations to meet their own needs.” (WCED 1987: 8).*

Based on this, to meet consumer wants the continual utilization of our most prized natural resources in the current day, will hinder the capacity of future generation to meet their own wants (Beredugo & Mefor, 2013). The complete and total neglect of negative externalities of oil and gas mogul in Nigeria. Due to crude oil exploration and exploitation, the environs have experienced high pollutions (such as oil spillage, gas flaring, black soot, clay soot, among others forms of vices. Since, corporate firms act in an environmentally irresponsible manner, the host communities have been affected as their environs and sources of living or income may be negatively impacted leading to low sustainable development-Human Development Index (HDI), the agent of government and its regulators will likely be blamed for allowing or colluding with the organization, investors may lose their investments if the government or host community take punitive actions against the firm and the staff will not be left out.

Thus, the study is on the mission to find out the refusal of companies to adhere to EA exposé practices and their attended consequences on the health, education and standard of living of host communities which are sustainable development thereby having a deleterious and externality influence on the Nigeria economy.

The remainders of the study as follows, section two deals with literature review and hypotheses development, research method is in section three, section four houses the analyses of results and lastly section five deals with summary, conclusion, recommendations, and policy implications.

## **2. LITERATURE AND HYPOTHESES DEVELOPMENT**

### **2.1 Sustainable development**

Sustainable development (SD) is an organizing fundamental which are encapsulated and kit together to meet human development goals while also sustaining the ability of natural systems or ecological system to provide the natural resources and ecosystem services on which the economy and society depend. According to Brundtland Report, (1987) “Sustainable development is the idea that human societies must live and meet their needs without compromising the capability of future generations to meet their own needs.” Precisely, sustainable development is a way of organizing society longevity survival. With a comprehensive accounting and consideration for both the imperatives present and those of the future, such as the preservation of the environment and natural resources or social and economic equity is being guaranteed.

This concern of the SD has been an illusion in Nigerian context and content, Nigeria’s overall

economic under – performance since independence in 1960 is a self-afflicted experience given her rich human and natural resource endowment. Nigeria is actually too endowed to impoverish her populace (Adeusi & Olarotimi, 2018) Unfortunately, Nigeria is one of the world's economically backward countries. In the past, Nigeria produced adequate food to feed its people as well as to export. Today, its economy is largely reliant on oil production. The agricultural sector is unable to produce an adequate amount of food that made Nigeria experienced food insecurity. Heavily depend on oil has led Nigeria to national instability, corruption, environmental degradation and economic exploitation.

The Nigeria's economy is a central point income, diverse economy and up-coming market with expansion of the Oil and gas (O&G), Agriculture, industrialization and services. Nigeria economy is highly reliant on O&G making Nigeria the largest oil producer in Africa, and the sixth biggest in the Organization of Petroleum Exporting Countries (OPEC). The innovation of oil has changed Nigeria's political economy, and oil has for the past two decades provided approximately 90% of foreign exchange earnings and 80% of federal revenue.

The Agricultural sector which is been represented by the black colour in the coat of arm which stands for fertile soil and good arable lands, which is the bases upon which the development of stable human communities (both rural and Urban communities) depended on in many parts of the world. The Agricultural sector which is a key factor of the Nigerian economy has the potential to shape the landscape, provide environmental benefits such as conservation, guarantee sustainable management of renewable natural resources, preserve biodiversity and contribute to the viability of rural areas. Through the varieties of activities, Agriculture is belief to have a high multiplier and linkage effect on any nation's quest for global sustainable development goals. The sustainable development is been proxy by environmental sustainability in Human Development Index;

### **2.1.2 Human Development Index (HDI)**

The Human Development Index is a statistic amalgamated index of life expectancy, education, and per capita income indicators, which are used to rank countries into four tiers of human development. HDI summaries the average achievement of key magnitudes of human development: healthy and long life, having decent standard of living and being knowledgeable. The HDI indicates the geometric average of standardized indicator of each of the three dimensions (UNDP 2021). Healthy ecosystems translate to our health and future survival, simply because human beings are a smaller aspect of a larger ecology.

HDI was advanced by Pakistani economic expert Mahbub-ul-Haq, trailed by Amartya Sen, an Indian economic expert, in 1990. It is a comparative measure of life expectancy, education, literacy and standard of living. Essentially, HDI makes use of four parameters in determining and ranking countries in line with their economic and social development which includes the Life Expectancy at Birth, Expected Years of Schooling, Mean Years of Schooling and Gross National Income per Capita. Nations have higher score in HDI once the lifespan/lifecycle, the education level and the GDP per capita are higher side, while the fertility rate and the inflation rate are at lower hem (Smit 2016).

Sustainable development began when the conception of progress was defined as industrial growth and economic expansion. The education system and public relations campaign promoted "consumption". The HDI was instrumentalized in order to see persons and their proficiencies should be the ultimate criteria of evaluating countries' development of a country, not economic development alone. Through the instrumentality HDI, countries comparison enabled.

### 2.1.3 Sustainability Accounting (SA)

Sustainability accounting is considered a subcategory of financial accounting that focuses on the disclosure of non-financial information about a firm's performance to external stakeholders, such as capital holders, creditors, and other authorities. Sustainability accounting represents the activities that have a direct influence on society, environment, and economic performance of an organization. SA in managerial accounting contrasts with financial accounting in that managerial accounting is used for internal decision making and the creation of new policies that will have an effect on the organization's performance at economic, ecological, and social. Hence, SA illuminates part of financial accounting that captured under social, economic, and environmental accounting. The SA is narrow down in this study to EA. Hence, environmental accounting as a proxy for sustainability accounting.

EA is a vital tool for dissecting the critical role played by the environment naturally in the economy. it provides data which pinpoint both the contribution of natural resources to economic wellbeing and the costs imposed by pollution that affect air, water, noise and resource degradation.

EA can be traced to the "Rig Veda", Hindu the Philosopher. The Rig Veda proclaims that environment is to be treated and lured like children. EA is an inclusive aspect of accounting. It is means of disclosing externality activities of firm of its immediate environment. EA engenders reports for both external and internal use, environmental information provided to assistance in management decisions on the ability to control the overhead, pricing and capital budgeting. Disclose environmental information t to the public and government, to the financial community (Kayode, 2011). Environmental problems like deforestation and pollution threatened species and endangered human exitance. Businesses are expected to disclose EI the their prepared annual report that will portraint both quantitative and qualitative statistics about their operations and performance to be presented to their stakeholders, shareholder inclusive. The information content requirement by stakeholders helps in disclosing information about organizational performance and report on environmental accounting, which is externalities activity.

The study of Steele and Powell, (2002) opined that EAD comprises of identification, collation, allocation and analysis of material streams and their connected with money flows by using environmental accounting systems to provide insight in environmental impacts and associated financial effects. According to Pramanik, Shill, and Das, (2007), Environmental disclosure is a process by which a corporation or organization communicates its information regarding the range of its environmental activities to a variety of stakeholders. The aim of EA reporting is to fulfill accountability and transparency purposes while providing useful information for timely and appropriate decision making by interested parties. Pramanik et al. (2007) further expressed the report as the company's way for the provision of information about environmental performance, and meeting financial markets and at the same time providing itself with a positive environmental image. In addition, environmental reporting is considered as a valuable evaluation tool for corporations and individuals, when making investment decisions (Lu &Li 2020; Pien 2020; Tzouvanas, Kizys, Chatziantoniou, & Sagitova, 2020). EA involves environmental management which is the procedure of allocating natural resources so as to make optimum use of the environment in satisfying basic human needs, if possible, for an indefinite period and with minimal adverse effects to the environment

Udo (2018) described EAD serves as a means through which businesses can bring to the knowledge of stakeholders of the company's performance in their eco-friendly performance to improve values and corporate image in addition to create a sustainable base to enhance incomes and productivity in it going concern concept since no business can boast of not affecting the environment. Association of Chartered Certified Accountant (ACCA) (2015) opined that EAD is

the availability of information that are skewed toward nonfinancial and financial information has ecological impact or footprints for a particular accounting period. Cornnor (2006) also asserted that EA is any form of accounting involving the collection, recording, and reporting of internal and external information about the financial and non-financial impact of organizational activities upon individuals, society and more generally on the physical environment.

EA is a management tool for enhancing the economic performance of the organization. According to UK Environmental Agency (2006), EA is the collection, analysis and valuation of environmental and company performance raw fact obtained from corporate management and monetary accounting system. EA is the incorporation of environmental costs and information into a variety of accounting practices. It is an important tool for understanding the role played by the natural environment in the economy. EA reporting was measured by the environmental costs (Internal Water Disclosure I and External) which according to Global Reporting Initiatives (GRI) encompassed under Performance indices on the environment which are: Materials Disclosure, Energy Disclosure, Water Disclosure (WAD), Biodiversity Disclosure (BDD), Emission Disclosure (EMD), Effluents and Waste Disclosure, Product and Services Environmental Impact Disclosure and Compliance to Environmental Laws and Regulation Disclosure (CELRD)

#### 2.1.4 Water Disclosure (WAD)

WAD provides information relating to industrial activities of O&G operation and externality influence on the host waters resources. Production of portable in the host community are mirage during petroleum production often contains chemical, oils and sometimes naturally occurring radioactive materials, which could harm the environment. But disclosure will thereby be improving the company's reputation and building investor confidence, establishing a dialogue and building credibility with key stakeholders, paving the way for future partnerships to

The levels of lead, cadmium, manganese, and chromium exceeded their threshold limits of (0.01, 0.003, 0.4, and 0.05 mg/L, respectively) set by the World Health Organisation (WHO) health-based guideline for drinking water. Since these open water bodies serve the local population for potable water supply and sundry uses, this could portend environmental and health hazards (WHO 2008). Ingestion of these metals may pose great risks to human health. Trace metals such as lead and cadmium will interfere with the function of essential nutrients of similar features such as calcium (Ca<sup>2+</sup>) and zinc (Zn<sup>2+</sup>). Lead, because of its size and charge similarity, can substitute for calcium and included in bone. Lead in bone is not harmful but if high levels of calcium are ingested, lead in bone is replaced, then free lead in the body system may cause nephrotoxicity, neurotoxicity, and hypertension. Under long-term environmental exposure, the effects include disturbances in the resorption in the proximal tubules, lung diseases, and the skeletal system disorders.

According to Ajit Gulabchand (2012), a robust mechanism for annual water disclosure, will not only help the company to abide with their commitment of transparency to the CEO Water Mandate but also enables them to identify gaps, explore possibilities of improvement and devise mechanisms for intra-company completion to achieve water use efficiency.

Peter Swinburn (2014) opined that through regular and open disclosure, common goals can be established to shared rewards. Molson Coors believes that disclosure around our water use is imperative in order to provide a collective understanding and approach to effective water stewardship in the communities where we operate. We continue to realize the direct benefits of disclosure, through risk reduction, cost savings and water quality improvements, and together with positive community engagement, education and outreach, water stakeholders within our brewing and supplier communities' benefit. Hence, hypothesis is developed in alternative form ***H1<sub>2</sub>: Water disclosure (WAD) has significant impact on Human Development Index (HDI).***

### **2.1.5 Biodiversity Disclosure (BDD)**

The objective of biodiversity disclosure is to financially account for biodiversity-related impacts or dependencies of businesses. The rich biodiversity fountain of the Nigeria particularly in Niger Delta region is critically besieged under severe threat. The diversity sources are domiciled in the region and experienced deforestation, invasive alien species inadequate and dehumanize manner of farming practices and oil and gas exploration spillage.

The Niger Delta is the main seat of oil and gas production in Nigeria. The varying activities O&G exploration and exploitation have harmful effects on the area ecosystem and biodiversity. Oil survey by seismic firms involves surveying, clearing of seismic lines, and massive dynamiting for geological excavations. The explosion of dynamite in aquatic environments leads to narcotic effects and mortality of fish and other faunal organisms (Zabbey, 2004). The burying of oil and gas pipelines in the Delta fragments rich ecosystems such as rainforests and mangroves. Apart from the reduction in habitat area, clearing of pipeline track segregates natural populations, which may in turn distort breeding behavior. Oil spillages routinely occur in the Niger Delta. Sources of oil entering the environment are variable, including pipeline leakage and rupturing, accidental discharges (tank accidents), discharges from refineries and urban centers, etc. There are also biogenic sources of hydrocarbons in the environment. Most of these oil-spill incidents reported in Nigeria occurred in the mangrove swamp forest of the Niger Delta region. Mangrove, of course, is one of the most productive ecosystems in the world with a rich community of fauna and flora. Thus, hypothesis developed in alternative form.

***H1<sub>1</sub>: Biodiversity Disclosure (BDD) has significant influence the Human Development Index (HDI).***

### **2.1.6 Emission Disclosure (EMD)**

Nigeria being a developing nation, endowed with abundant natural resources such as petroleum, natural gas, coal, limestone, vegetation etc. is not devoid of environmental degradation. In many countries have attempted to harness these resources to enhance infrastructural and economic development for the benefit and well-being of their citizenry but contrarywise and invariable externalities were been experienced in diverse array of pollutants include greenhouse emissions, carbon dioxide, warming etc. These are hazardous and dangerous to living organisms' existence. The effects of petroleum and crude oil pollution on man, plants and microbial population cannot be over-emphasized.

Innumerable effects of diverse hydrocarbons include chronic exposure may cause leukemia and birth defects, ethylbenzene which may cause dizziness, slower reflexes, loss of consciousness and death; zylene may cause damages to a developing foetus, liver, kidney, skin, eyes, and bone marrow (Mabogunje, 2007). Unsustainable consumption of natural resources, increased contribution to Greenhouse gas emissions (GHG), contribution to ozone layer depletion amongst others are prevalent in Nigeria and serve as impediments to favourable business climate and human inhabitation in general. Oil exploration and exploitation (both indigenous and foreign companies) can contribute towards sustainable environment by innovating and improving their products and processes in order to use raw materials more efficiently reduce the waste generated from their processes, improve the waste disposal methods and improve the work conditions. Obemene and Olaoye (2009) echoed it, in their study that the emerging companies did not incorporate environmental management plan, waste management and pollution control. Even though where the environmental laws, pollution control and waste management in the strategic planning of firms, it seems inadequate or where they exist, largely unenforceable

***H1<sub>3</sub>: Emission Disclosure (EMD) has significant effect on the Human Development Index (HDI).***

### **2.1.7 Compliance to Environmental Laws and Regulation Disclosure (CELRD)**

This deals with disclosure of monetary value of significant fines and the total number of non-monetary sanctions for noncompliance with environmental laws and regulations. McGuire, (2014) ascertained that environmental compliance encapsulates companies conform to and comply with environmental laws and regulations (Zeng *et al.* 2010), standards (Goron 2018), and other general and specific requirements. As a result, upsurge of recent environmental degradation concerns of externalities environmental, barometer has been strategically law that compelled companies' activities peradventure they conform with ecological rules, regulations and laws.

In the emerging countries like Nigeria in particular, research hitherto conducted has revealed that EA disclosure is out of volition or voluntary because of non-availability of both international or local standards in order to guide disclosure. Hassan and Hakan, (2012) suggested that regulatory, Statutory, quasi-regulatory, agents and standard setters have not prioritized the reporting procedures and disclosure checklist for EA. While the accounting profession globally recognized the financial importance and significance of environmental cost and benefits

In cases of no compliance to environmental regulations, fines and penalties are charged. These may include cost drivers like illegal discharges to the environment, or releases to the environment above permitted quantities. One of the benefits of Environmental Accounting and Reporting include avoidance of any penalty or fines payable as a result of environmental offences as prescribed by Environmental Protection Agency in the countries where such legislation exists (Adediran & Alade, 2013).

Environmental laws are established to mitigate the threatening environmental problems, which arises from human activities in the quest for economic growth and development (Hakeem & Joseph, 2014). According to Adelan (2004) suggested that upsurge in this area the need for environmental control get to your feet from the fact that it brings improved health and living conditions. Nigeria enacted Environmental related Acts and Decree before the inception of Nigerian independence under different context by her colonial master (Great Britain). These laws were scattered and uncoordinated as there was no fully organized institution to coordinate and discharge environmental related duties.

***H1<sub>4</sub>: Compliance to Environmental Laws and Regulation Disclosure (CELRD) have positive impact on the Human Development Index (HDI)***

## **2.2 Theoretical Review**

### **2.2.1 Sustainability Theory**

The philosophy behind sustainability is encapsulated to general public attention in 1972 report, title Limits to Growth by the international think tank Club of Rome. In 1980 the World Conservation Strategy developed by the International Union for Conservation of Nature, in collaboration with the United Nation Environment Programme and World Wildlife Foundation, worked to make sustainability a benchmark of international action due to Previously unthinkable impacts like a mass extinction caused by humanity or significant anthropogenic changes to the planet's biosphere indicate a major shift in humanity's relative to the rest of nature and its own future.

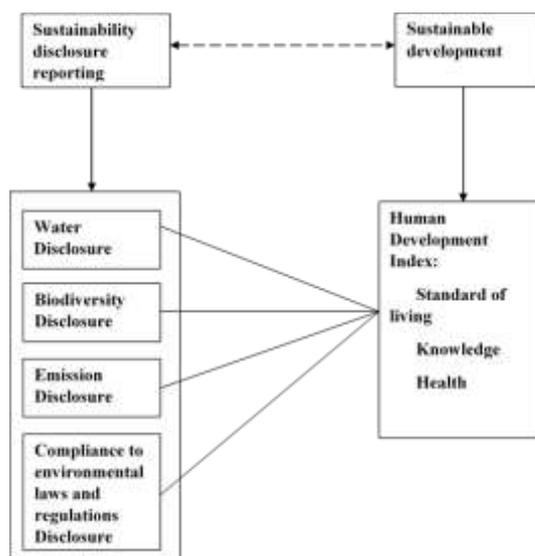
Giangrande et al., (2019) "Sustainable development (SD) means meeting the present's needs without prejudice to the ability of future generations to meet their own needs, which implies that the fortification and preservation of natural resources and the development of ecofriendly sustained with capability. Theory of Sustainability describes a form of economy and society that is lasting and can be lived on a global scale. According to Willis Jenkins of Yale Divinity School, Sustainability Theories attempt to prioritize and integrate social responses to environmental and cultural problems. To be precise and fundamentals, sustainability connotes ability to constantly maintain some entity, outcome, or process over time. Agriculture, forest management, or

financial investment might be deemed sustainable, meaning that the activity does not exhaust the material resources on which it depends. By focusing on the ecological dependency of economic and social systems, sustainability illuminates the mutual effects between environmental degradation caused by human activities and the perils to human systems presented by global environmental problems.

Problems like biodiversity loss and climate change point to the global reach of humanity's powers and the scale of its risk. Mitigating their impact and risk seems to require reform across many human systems: financial, political, production, energy, transportation, and even communication and education. Economic health, ecological integrity, social justice, and responsibility to the future must be integrated to address multiple global problems within a coherent, durable, and moral social vision.

### 2.5 Conceptual Framework

Conceptual framework of any study, conceptualizes presumed links between the regressor and regressed. This study is considering the impact of SA on sustainable development, where SA is the explanatory variables and SD is the dependent variable of the study. SA has been sub grouped into environmental, economic and social accounting. But the study conceptualized EA as proxy for sustainability accounting, on the other side, human development index as proxy for sustainable development.



**Fig 1: Conceptual Framework**  
 Source: Author's Compilation (2021)

### 3. METHODOLOGY

This study employed *ex-post facto* research design, where data were extracted from annual published financial statements of oil and gas companies listed and quoted on the Nigeria Exchange Group in Nigeria from 2011 to 2020 as well as data on Human Development Index 2011 to 2020 as published by United Nation Development Project. The population of the study is all the eight (8) listed companies that are involved in oil and gas activities situated in Nigeria as shown in the Nigeria Exchange Group from 2011 to 2020 but purposive sampling technique was used to select the sampled firms.

### 3.1 Model Specification

The sustainability accounting items will be measured by the component of environmental accounting against the HDI which is a measure of the sustainable development. The data were then analyzed using linear regression analysis through the use of econometric model specified below:

$$sd = f(wd, bd, ed, cesd) \text{----- (1)}$$

Where: sd = Sustainable development proxy by Human Development Index.

Where EA (water disclosure, bd = Biodiversity Disclosure, ed = Emission Disclosure

cesd = Compliance to Environmental Laws and Regulation Disclosure (cesd)

The above equation is restated in its implicit form as:

$$HDI = f(WAD, BDD, EMD, CELRD) \text{----- (2)}$$

Specifying it in econometric form, we have;

$$HDI = \Omega_0 + \Omega_1 WAD_{it} + \Omega_2 BDD_{it} + \Omega_3 EMD_{it} + \Omega_4 CELRD_{it} + \epsilon_{it} \text{----- (3)}$$

Where;

HDI = Human Development Index used to measure the Nigeria Economy

$\Omega_0$  = Intercept

$\Omega_1 - \Omega_4$  = coefficient of the parameters of the equation

HDI = Human Development Index

### 3.2 Measurement of Variables

HDI was measured using mortality rate caused by emission of gases, water pollution and Number of deaths and missing persons attributed to disaster.

Water Disclosure (WAD) was proxy by information disclosed about polluted water bodies and reservation of water bodies as well as provision of good drinkable waters for the host communities. When such information is disclosed is 1 where otherwise 0

Biodiversity Disclosure (BDD) was proxy by information disclosed on biodiversity conservation. When such information is disclosed is 1 where otherwise 0

Emission Disclosure (ED) was proxy by information disclosed on combating and reducing the release of gases into the surroundings. When such information is disclosed is 1 where otherwise 0

Compliance to Environmental Laws and Regulation Disclosure (CELRD) was proxy by disclosed information penalties, sanctions for noncompliance with environmental laws and regulations. When such information is disclosed is 1 where otherwise 0

## 4. DATA ANALYSIS AND DISCUSSION OF FINDINGS

### 4.1. Descriptive Statistics

Table 1 provides information about descriptive statistics such as mean, median, maximum and minimum value, as well as the distribution of the sample measured by the skewness and kurtosis statistics and its total observation. The sustainable development which is measured using HDI has mean of 0.524 and Median of 0.53, with associated standard deviation value of HDI is 0.017. This means that the variable is unreliable since there is a wide gap between the mean and standard deviation. It also has a maximum value of 0.55 and a minimum value of 0.49. The Skewness of Human Development Index (HDI) is -0.64 and Kurtosis of 2.72, this means that HDI skewed negatively (-0.64) and the degrees of the skewness is high (2.7).

The Environmental accounting disclosure is an integral part of sustainability disclosure, this paper proxy or measured by water disclosure, Biodiversity disclosure as well as Emission disclosures of companies have a mean of 0.051 each which means that Environmental accounting disclosure relating to these variables (Water disclosures Biodiversity disclosure, Emission disclosure) by companies have an average disclosed in the financial statement to the extent of 0.051 each while their median is 0. The maximum and minimum values of Water disclosures, Biodiversity disclosure, and Emission disclosure are 1 and 0. This is because the water

disclosures are represented by 1 if the companies disclosed it and 0 if they did not disclose it for the period of the study. The deviation from the average of the variables is 0.2220001 which means that the data were normally distributed since there is no wide gap between the mean and the deviation from the average which is the standard deviation. The skewness and kurtosis of the variables (Water disclosures Biodiversity disclosure, Emission disclosure) are 4.07 and 17.55 respectively.

The compliance to environmental laws and regulation disclosures has a mean average of 0.013 while the median is 0. From the mean, the compliance to environmental laws and regulation disclosures only accounts an average mean of 0.013 of all the environmental accounting disclosure variables disclosed in the financial statement. The maximum value of the compliance to environmental laws and regulation disclosures is 1 because the disclosure is represented by 1 if it disclosed and with 0 if it is not disclosed in the financial statement during the period of the study. The corresponding minimum value of compliance to environmental laws and regulation disclosures is 0. The deviation from the mean is 0.113 which is not closely netted. The skewness and kurtosis of performance indicator are 8.66 and 76.0.

In summary, the disclosures are voluntarily, that is the reasons from the descriptive statistics, 1 denoted that there is disclosure while 0 means no disclosure. Therefore, the median of all these parameters is 0, which means almost the companies refused to disclose the Environmental accounting disclosures.

**Table 1: Descriptive Statistics**

Statistics	HDIINDEX	WAD	BDD	EMD	CELRD
Mean	0.52	0.05	0.05	0.05	0.01
Median	0.53	0	0	0	0
Maximum	0.55	1	1	1	1
Minimum	0.49	0	0	0	0
Standard deviation	0.0	0.2	0.2	0.2	0.1
Skewness	-0.6	4.1	4.1	4.1	8.7
Kurtosis	2.7	17.6	17.6	17.6	76.0
Counts	80	78	78	78	78

**Source: Authors' Computation (2021)**

#### 4.2 Correlation matrix

The correlation test was carried out to examine the level of relationship among the dependent and independent variables in order to minimize the problem of multicollinearity which might understate or overstate the standard errors and thereby leads to type-1-errors. Table 4.2 also shows the existence of weak relationship among the independent variables but there is positive relationship between the dependent (HDI) and Independent Variables (Water disclosures, Emission disclosure and compliance to environmental laws and regulation disclosures) apart from Biodiversity disclosure. This result reveals that there is no multicollinearity problem among the independent variables because the nexus among them are weak. Therefore, highly efficient and consistency estimates will be obtained from the variables.

**Table 2: Correlation Analysis**

	Hdi index	wad	bdd	emd	Celrd
Hdiindex	1.0000				
Wad	0.1606	1.0000			
Bdd	-0.0830	-0.0541	1.0000		
Emd	0.0214	-0.0541	-0.0541	1.0000	
Celrd	0.1810	-0.0265	-0.0265	-0.0265	1.0000

**Source: Authors' Computation (2021)**

### 4.3 Analysis and Interpretation of Linear Model Using Panel Data Regression

From the regression analysis in Table 4.3 and 4.4, panel data regression comprising of fixed and random effect was done to ascertain the effect of environmental accounting disclosure on the Nigeria economy. Also, the Hausman specification test was carried out to know which model is more appropriate for the study. From the result, it was gathered that the fixed effect model is more appropriate because the p-value of the Hausman test revealed a p-value of 0.9551 that is not statistically significant at 5%. The full results of the fixed and random effect as well as the Hausman test are attached as appendix. In view of this, the fixed effect model was used for analysis. Therefore, fixed effect model is used to test the formulated hypotheses on the effect of environmental accounting disclosure on the Nigeria economy.

Table 3: Panel Data Regression Result for HDI model

VARIABLES	(fixcd) hdiindex	(random) hdiindex								
Wad	0.00111 (0.00932)	0.00162 (0.00869)	0.00368 (0.00919)	0.00243 (0.00858)	0.00416 (0.00961)	0.00244 (0.00893)	0.00921 (0.00966)	0.00651 (0.00895)	0.00109 (0.0114)	0.00635 (0.00903)
Bdd			0.0231** (0.0113)	0.0149* (0.00858)	0.0232** (0.0113)	0.0149* (0.00865)	0.0240** (0.0111)	0.0151* (0.00846)	0.0227** (0.0111)	0.0149* (0.00855)
Emd					-0.00213 (0.0114)	-5.30e-05 (0.0102)	-0.0186 (0.0136)	-0.0157 (0.0125)	-0.0146 (0.0138)	-0.0158 (0.0126)
Ceird							0.0465*** (0.0218)	0.0433*** (0.0206)	0.0698*** (0.0280)	0.0447*** (0.0215)
Environ										
Constant	0.523*** (0.00206)	0.523*** (0.00197)	0.522*** (0.00211)	0.523*** (0.00200)	0.522*** (0.00215)	0.523*** (0.00203)	0.522*** (0.00209)	0.522*** (0.00199)	0.525*** (0.00344)	0.523*** (0.00215)
Observations	78	78	78	78	78	78	78	78	78	78
R-squared	0.000		0.059		0.059		0.120		0.142	
Number of s. 10	8	8	8	8	8	8	8	8	8	8

Source authors computation (2021) Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

From table 3, Water disclosures Biodiversity disclosure, Emission disclosure and compliance to environmental laws and regulation disclosures turned a p-value that is not statistically significant at 5% for all the four variables in the model. And the result is discussed in this section as well.

#### **4.4 Testing of Hypothesis and Discussion of Findings.**

##### **4.4.1 Hypothesis one: Water disclosure (WAD) has significant impact on Human Development Index (HDI).**

The result in table 4.3 shows that Environmental water disclosure has a positive and statistically insignificant impact on HDI. This shows that water disclosure has direct effect on the HDI (Standard of living (SoL), Health and Education of the populace) in Nigeria. The coefficient of water Disclosure is 0.06%, this means firms could disclose 0.6% information in financial statement. This signifies that based on Disclosure of the oil and gas companies, environmental water disclosure has direct influence on the Nigeria Economy HDI but statistically insignificant. The result is aligned with studies of (Hussain, & Dey, 2021; Olayinka & Osariemen, 2019; Yu, *et al.*, 2020; Yumashev *et al.*, 2020).

##### **4.4.2 Hypothesis two: Biodiversity Disclosure (BDD) has significant influence on the Human Development Index (HDI).**

The result in table 4.3 shows that Environmental Biodiversity disclosure has positive impact on HDI. This shows that Biodiversity disclosure has direct influence on the HDI (SoL, Health and Education of the populace) in Nigeria. The coefficient of Biodiversity Disclosure is 1.15%. This indicates firms could only disclose 1.15% information as relates biodiversity.

This signifies that based on Disclosure of the oil and gas companies, environmental Biodiversity disclosure has direct influence on the Nigeria Economy HDI and statistically significant. This result is agreed with the studies (Amahalu, 2018; Gyane, 2019; Nzekwe, *et al.*, 2021; Qian, Tilt, & Belal, 2021).

##### **4.4.3 Hypothesis three: Emission Disclosure (EMD) has significant effect on the Human Development Index (HDI).**

The result in table 4.3 shows that Environmental Emission disclosure has negative impact on HDI. This shows that Emission Disclosure have adverse effect on the HDI (SoL, Health and Education of the populace) in Nigeria. The coefficient of Emission Disclosure is 1.16%. this implies that firms could only disclose 1.16% information that is associated with emission disclosure. This signifies that based on Disclosure of the oil and gas companies, environmental Emission disclosure have indirect impact or effect on the Nigeria Economy HDI and statistically insignificant. (Abubakar, 2014; Wen, 2017; Nzekwe, *et al.*, 2021; Sarpong, & Bein, 2020; Ramdhani, 2010).

##### **4.4.4 Hypothesis four: Compliance to Environmental Laws and Regulation Disclosure (CELRD) has significant impact on the Human Development Index (HDI)**

The result in table 4.3 shows that Compliance to Environmental Laws and Regulation Disclosure have positive impact on HDI. This shows that Biodiversity disclosure direct much effect on the HDI (SoL, Health and Education of the populace) in Nigeria. The coefficient of Compliance to Environmental Laws and Regulation Disclosure is 4.45%. this connotes that firms could only disclose 4.45% information as relate to Compliance to Environmental Laws and Regulation Disclosure. This signifies that based on Disclosure of the oil and gas companies, Compliance to Environmental Laws and Regulation Disclosure have direct impact or effect on the Nigeria Economy-HDI and statistically significant, (Hector, M. (2017). Ayuk, 2020).

## 5. CONCLUSION AND RECOMMENDATIONS

This section presents the summary of major findings to impact of EA disclosures on the Nigeria economy that is how EA disclosures variables such as water disclosure, biodiversity disclosure, emission disclosure and Compliance to Environmental Laws and Regulation Disclosure (Environmental Accounting Index) affect the standard of living, health as well as knowledge or education HDI of the populace. Conclusion and recommendation from the study were also presented.

The adverse effect of company's activities on the environment has become so alarming and as such posed a serious challenge and threat to world economy especially developing countries Nigeria inclusive, which had called for global awareness of the need to combat and reduces these effects to the lowest level. These environmental problems have really affected the SoL and health as well as the education of the populace of the host communities especially Niger Delta region of Nigeria. Companies are therefore required to disclose in their annual report both qualitative and quantitative information about their operations and performance to be presented to their shareholders and stakeholders.

It can be concluded from the findings of this study that Environmental Accounting Disclosures of oil and gas companies are vital and crucial as well as a great determinant of growth and survival of the Nigeria economy in term of HDI. To improve the economy wellbeing, companies must disclose their environmental index though the disclosures are voluntary, hence the need to make Environmental disclosures compulsory for companies as well as put effective measures in place that will enforce Compliance to Environmental Laws and Regulation such as high number of fines and penalties, sanctions, jailing, closing down of companies which refuse to compliance etc. Also, companies should ensure they manage the environment in such a way that will be conducive for the survival of the populace as well as plants and animals.

The study therefore recommended that corporate entities should develop positive attitude towards disclosing the consequence of their activities on the environment as well as measures been taken to combat the environmental problems caused by their activities as well as Compliance to Environmental Laws and Regulation.

Also, environmental disclosures should be made compulsory and not voluntary as well as setting up effective measures and strategies to enforce and ensure Compliance to Environmental Laws and Regulation. Finally, companies should adopt to strict uniform reporting and disclosure of ecological issues for the purpose of control and measurements of performance.

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