

Environmental Accounting and Environmental Capacity for Sustainable Economy in Nigeria

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Abstract: Environmental capacity serves as the natural reservoir for the common treasure of the nation. It determines the wealth of the society that is meant to serve both the present and future generations, it therefore demands efficient management for its sustainability. Meanwhile, human activities do exert some negative impact on this natural capital that may adversely affect their sustainability. It is therefore considered imperative that we have good understanding of accounting for these impacts and their relationships. Studies have shown that many countries especially developed nations have integrated environmental accounting into their national operations to ensure capacity for sustainable economy, which Nigeria is yet to fully practice. The study examined the effect of environmental accounting on environmental capacity for sustainable economy in Nigeria. The study examined the effect of environmental accounting's ability to absorb cost of environmental impact on environmental capacity for sustainable development. The study adopted descriptive survey design. The population comprised of stakeholders in financial reporting chain as relates to environmental issues. The sample size of 150 was purposefully selected. Validated and structured questionnaire was used to obtain data from the respondents. A total of 69% retrieval rate was achieved. The Cronbach alpha coefficients ranged between 0.804 and 0.942. Data were analysed using descriptive and inferential (multiple regression) statistics to analyse the data at 0.05 level of significance. Findings revealed that: environmental accounting possessed the ability to absorb and recover the cost of environmental impact on environmental capacity for sustainable development ($Adj. R^2 = 0.685$, $F = 112.859$, $P = 0.000$). Specifically, Environmental Accounting significantly assist in accounting for environmental impacts towards framework for the ability of natural systems to absorb cost of those impacts for Sustainable Economy; and that Environmental Accounting significantly assist in accounting for environmental impacts towards framework for the ability of natural systems to recover from those impacts for Sustainable Economy. The study concluded that Environmental Accounting exerted the ability of Environmental Capacity to absorb and recover from environmental impacts towards framework for Sustainable Economy. The study recommended that environmental accountants should make EAP a normal practice, establish thorough methodology, and interact with specialists such as ecologists and environmental scientists and governments should integrate EAP into national accounting systems and regulatory frameworks, offer financial incentives and support to organizations, as well as invest in research and development, and encourage collaboration among stakeholders.

Keywords: Environmental accounting, Environmental capacity, Environmental impact, Natural capital, Sustainable economy.

1.0

INTRODUCTION

1.1 Background of the Study

Because of increased concern about resource use and the development of post-consumption waste, environmental law is shifting away from end-of-pipe measures. The emphasis has been shifted from manufacturing processes to life cycle viewpoint that targets the product developed. It is “an approach that evaluates the potential environmental impacts associated with each stage that a product or material goes through during its lifetime, from cradle to grave” (UBQ, 2023). It is an important tool for businesses because it allows them to keep records and measure the material flow and environmental impact of various stages of their product's life cycle. This is in order to make strategic decisions regarding ways they can improve their operations and reduce the product's

overall impact on the environment. Product quality often considers product design, customer preferences, and the ecological characteristics of products.

Concerns regarding the environmental effect of human activities have grown over time. Environmental awareness and knowledge have developed significantly, leading to greater attempts to address and mitigate the harmful effects of human activities on the environment. These worries can be linked to a variety of historical events and developments. The Industrial Revolution (1760 to 1840), marked a shift in human activity, leading to increased urbanization, factory pollution, and resource exploitation. This creating early concern about the environmental effects of unregulated human activity. The Conservation Movement (19th century) also emerged in response to deforestation, wildlife extinction, and degradation of natural resources, with figures like John Muir and Theodore Roosevelt advocating for the preservation and protection of natural landscapes and resources. Rachel Carson's book "Silent Spring" (1962) was credited with inspiring the modern environmental movement. The United Nations Conference on the Human Environment (1972), was the first global conference on environmental issues, bringing together governments, NGOs, and other stakeholders to address concerns about pollution, deforestation, and other environmental problems. It marked a major milestone in international environmental awareness and action. Climate Change Awareness (late 20th century to present) has been a major environmental concern since the late 20th century. Reports from the Intergovernmental Panel on Climate Change (IPCC) and activism by environmental organizations and youth movements have highlighted the urgent need to address the impacts of human activities on the environment.

The importance of environmental accounting as a means to integrate environmental considerations into economic decision-making, promote sustainability, and support informed policy-making and planning for sustainable development is generally recognized. They actively support the development and adoption of environmental accounting frameworks, standards, and guidance at various levels, from national to organizational, to facilitate the incorporation of environmental considerations into accounting and reporting practices. According to Bansard and Schröder (2021), natural resource use has long been regarded as a component of both human rights and economic development, prompting the United Nations to announce that the right of individuals and countries to have perpetual control over their natural resources and wealth must be used in the interests of national development and the welfare of the citizens of the concerned nations. The 1972 United Nations Conference on the Human Environment in Stockholm, Sweden, established essential principles in this area, including: Principle 2: "The earth's natural resources must be safeguarded for the benefit of present and future generations through careful planning or management," and Principle 3: "The earth's capacity to produce vital renewable resources must be maintained and, wherever practicable, restored or improved." & Principle 5: "The earth's non-renewable resources must be used in such a way as to guard against the risk of future exhaustion and to ensure that the benefits of such use are shared by all mankind."

All these draw attests to the importance of taking environmental capacity as an issue of vital consideration. As humanity grapples with numerous global environmental crises, it is important to assess how advancements in the environment has been promoted in the past and how to use those lessons to reestablish multilateral cooperation in a post-COVID world (United Nations, 2022).

Environmental accounting is the practice of incorporating environmental considerations into financial and economic decision-making processes. It involves the identification, measurement, and reporting of costs and benefits associated with environmental impacts, risks, and opportunities. It can help organizations understand the financial implications of their environmental actions, make informed decisions, and improve environmental performance. The ability of natural systems to absorb, adapt, or recover from the effects of human activity without long-term degradation or damage is referred to as environmental capacity. It is a measure of natural systems' stability, resilience, and sustainability in the face of environmental stressors. Environmental capacity varies according to ecosystem type, biodiversity, climate, geology, and human activity. The idea of environmental capacity is significant in ecosystem management, environmental impact assessment, as well as sustainable development.

Environmental accounting is relevant to environmental capacity because it can give insights into the economic costs and benefits connected with the impact on the environment. Organizations can better understand the implications of their activities on environmental capacity, identify areas for improvement, and make more informed decisions to mitigate negative impacts and enhance sustainability. It can also be used to track and report on changes in environmental capacity over time, which can help determine the efficacy of environmental management practices and policies. Environmental accounting and environmental capacity are closely related as they involve assessing and managing the environmental aspects of human activities. Environmental accounting provides a tool for measuring and valuing environmental impacts, while environmental capacity provides a framework for understanding the ability of natural systems to absorb or recover from those impacts. Together, they can contribute to more effective environmental management and sustainability efforts.

1.2 Problem of the Study

Countries have historically used national income accounts to measure economic performance and the success of their development programs and goals. Traditional statistics based on national income accounts, such as GDP (gross domestic product), however, provide little insight into the long-term sustainability of present growth patterns. It is in both rich and developing countries' interests to move beyond traditional GDP and begin adding natural capital into national accounts in order to make better economic decisions. Rio+20 provides an important chance to increase previously expressed promises to embrace natural capital accounting as a step toward a more sustainable future.

The depletion of a country's natural capital impedes poverty reduction and long-term development goals. Environmental assets and ecosystem services are essential to human well-being and provide substantial economic and social benefits (Lange, *et al.*, 2021; World Bank, 2021; World Bank, 2022). The World Bank predicts that if some ecosystem functions fail, the world economy might lose \$US 2.7 trillion by 2030. GDP in low-income nations might fall by 10% each year on average, with bigger losses in countries that rely heavily on ecosystem services. Understanding the worth of a country's environmental assets is critical for long-term development and economic progress.

1.3 Objectives of the Study

The study examined the effect of environmental accounting's ability to absorb cost of environmental impact on environmental capacity for sustainable development. Specific objectives are:

- i. to examine if the ability of EC to absorb of environmental impacts has effect on sustainable development
- ii. to assess if the ability of EC to recover from environmental impacts has effect on sustainable development

1.4 Statement of Hypotheses

To achieve these objectives, the following hypotheses were drafted and tested:

H₀₁: Ability of the EC to absorb of environmental impacts does not have significant effect on sustainable development

H₀₂: Ability of the EC to recover from environmental impacts does not have significant effect on sustainable development.

In pursuance of the stated objectives, the study is divided in to five major components. Having addressed the first part of the components, component two focuses on review of related literature covering the theoretical, concepts of environmental accounting's ability to absorb cost of environmental impact on environmental capacity for sustainable development. The third component is on methodology employed in carrying out the study. Component four is on analysis of data collected and the component five provides the conclusion recommendations and contribution to knowledge accordingly. The results and recommendations of the study would contribute towards the unveiling of the contributions of environmental accounting's ability to absorb cost of environmental impact on environmental capacity for sustainable development in Nigeria and elsewhere.

2.0 REVIEW OF RELATED LITERATURE

2.1 Conceptual Review

2.1.1 Environmental accounting (EA)

According to the definition offered by the Parliamentary Assembly of the Council of Europe, environmental accounting (EA) is "a system for indexing, organising, managing and delivering data and information on the environment via physical or monetary indicators" (Giovanelli, 2004). Environmental accounting is the discipline of incorporating environmental variables into organisations' economic and financial decision-making processes. It entails identifying, measuring, and reporting the costs and benefits of consequences for the environment, risks, and opportunities. Environmental accounting seeks to capture the economic worth of natural resources, environmental assets, and environmental performance, and it may assist companies in understanding the financial consequences of their environmental actions, making informed decisions, and improving environmental performance. Environmental accounting, also referred to as "green accounting" or "natural capital accounting", has its roots in environmental economics and the rising understanding of the need to include environmental variables into economic decision-making. The origin of Environmental accounting generally may be traced back to the increasing acknowledgment of the environment's economic value, the need to integrate environmental factors into economic decision-making, and the establishment of approaches and frameworks for measuring and accounting for environmental performance and consequences.

Environmental accounting is “a field of study which analyse and identifies, measures as well as disclose the resource that had been used by the enterprise which impact the environment” (Deegan, 2013). Anggrayni *et al* (2022), argued that “environmental accounting research is mostly concerned with how firms account is used to disclose the environmental impact and to investigate the environmental impact on the firms”. Environmental accounting practice refers to “the generation of non-financial information as related to environmental practices in addition to the conventional financial accounting (Adegbe *et al.*, 2021). It is “a tool for disclosing environmental costs and practices to the stakeholders” (Falope, Offor & Ofurum, 2019). It serves “the purpose of improving the environmental performance of companies” (Adegbe *et al.*, 2021). Environmental accounting refers to modification of the System of National Accounts to incorporate the use or depletion of natural resources (Muralikrishna & Manickam, 2017). EA serves as “a vital tool to assist in the management of environmental risks and operational costs. It is “a set of aggregate data linking the environment to the economy, which will have a long-run impact on both economic and environmental policy-making”.

Muralikrishna and Manickam (2017), emphasised that EA does not at all “a valuation of environmental goods or services, social cost-benefit analysis of projects affecting the environment, or disaggregated regional or local data about the environment”. The authors however, argued that there exists “close links between environmental accounting and these three activities, which is why they are frequently discussed together”. Despite the fact that valuation is an important component of both social cost-benefit analysis and some methods to environmental accounting. However, valuation is simply one component of environmental account creation; it is not the same as account construction. Environmental accounting (EA) has a broad reach. Corporate, national, and international levels.

Examples or forms of EA are Environmental management accounting and Environmental financial accounting (Muralikrishna & Manickam, 2017; Vijai, 2020). Environmental management accounting focuses on material and energy flow data as well as environmental costs. It is subdivided into segments, "eco balance, corporate environmental reporting, environmental financial accounting, and environmental national accounting" (Muralikrishna & Manickam, 2017; Vijai, 2020). Environmental financial accounting focuses on reporting environmental liability costs and other major environmental expenses, whereas corporate environmental reporting informs the public of essential information prepared in line with environmental accounting. Finally, environmental national accounting is a type of accounting at the national level that focuses on natural resource stocks and flows, environmental costs, and externality costs. It is useful to know whether or not a firm has met its environmental duties. Essentially, Vijai (2020) stated the following benefits of EA: EA can quantify natural inputs to the economy and how the economy affects the environment (e.g., pollution and waste) from an economic standpoint. It can help to measure human well-being from a societal standpoint. EA may also be used to track changes in the environment, ecosystems, and their functioning from an environmental standpoint".

2.1.2 Environmental capacity (EC)

Environmental economics emerged in the 1960s with the pioneering works of economists such as Kenneth E. Boulding, Herman Daly, and Robert Costanza (Gonzalez & Peña-Vinces, 2022). The United Nations Conference on the Human Environment in 1972 called for greater integration of

environmental considerations into economic planning and policy-making, leading to increased interest in developing methodologies and frameworks for environmental accounting. This led to increased interest in quantifying the value of natural resources and ecosystems in economic terms (Chasek, 2020). Environmental capacity refers to “the ability of a place to support the life of living things optimally in a long period of time (Firmansyah *et al.*, 2020). This can be accomplished by planning, use, control, maintenance, monitoring, and law enforcement. Environmental considerations must be made when development is really put into action in order to keep the ecosystem healthy and sustainable. If we link the issue to the sustainable use of resources, the attempt to use resources for human wellbeing in a way that is not in excess of the carrying capacity of the available resources is the context (Chasek, 2020). In other words, the carrying capacity of the resources plays a major role in determining how sustainably resources are used. In order to support land use activities in a sustainable way, it is crucial to take land carrying capacity into account in regional spatial planning (Lilburne *et al.*, 2020; Liu, & Zhou, 2021).

Another milestone is the World Bank's WAVES initiative (2009) launched to mainstream natural capital accounting into national economic accounting systems in 2009. It provided guidance and technical support to countries in developing comprehensive environmental accounting frameworks to assess the economic value of natural resources, ecosystem services, and environmental degradation (Castañeda *et al.*, 2019; Reuter *et al.*, 2016). Following that, various methods and standards have been developed to operationalize environmental accounting, such as the System of Integrated Environmental and Economic Accounting (SEEA), the Corporate Sustainability Accounting (CSA) framework, and the Global Reporting Initiative (GRI) standards. These frameworks provide guidelines and tools for measuring, valuing, and reporting on environmental performance and impacts at different scales (Ramírez, Martínez & Rosado Ortiz, 2021). Starting from late 20th century to date, companies have been increasingly focusing on sustainability reporting in recent years, which includes disclosure of environmental performance and impacts (Larrinaga & Bebbington, 2021).

2.1.3 Sustainable development (SD)

Sustainability has become a generic term for many elements of life. Ecology and sustainability are now prevalent in many sectors of life, including modern corporate accounting. The advancement of civilization and industry creates severe issues for the conservation of natural ecosystems and ecological conditions. As a result, it begs the question of what businesses, management, governments and regulatory agencies can do to protect the environment not just now, but also in the future. Stipic (2019), defined Sustainable development as “a business practice that reflects the idea of meeting economic and environmental demands for the benefit of the wider community”.

United Nations (1987), defined sustainable development as a development that meets the needs of the present without compromising the ability of the future generations to meet their own needs. Ogbonna *et al.* (2020), opined that it “explains that processes of production must not trigger undue depletion of natural and human resources or threaten the environment”. As such, sustainability integrates economic, social, and environmental concerns. As the process of sensible use and preservation of natural resources for the long-term enhancement of the quality of life for generations to come. Sustainable development may thus be viewed as a facilitator for reconciling the demand for industrial and technical progress and advancement with the conservation of nature's

resources. Environmental accounting is taken to be an important tool for implementing the SD idea and is now widely accepted as a way of assuring environmental preservation; especially in the developed economies. Conventional economic analysis tools is found to be deficient in assisting decision-makers to properly assess the success of implemented environmental policies or the influence of economic policies on the environment.

The United Nations Conference on the Environment (Earth Summit in Rio de Janeiro) issued Agenda 21 for SD in 1992, which offered the concept of EA as a mechanism for executing coordinated policy in this area. Environmental accounting provides an objective view of the condition and evolution of natural heritage, connections between the economy and the environment, and expenditure on preventive measures, environmental protection, and environmental damage restoration. As a result, it is a critical instrument for putting the notion of sustainable development into action. The rising influence of human activities on the environment over the last ten years has demonstrated that the environmental costs of development are no longer readily dismissed issues, particularly in metropolitan settings. Since the Rio Earth Summit, the notion of EA has gained widespread acceptance as a critical instrument. Many of the developed economies have examined and experimented with EA systems, and some municipalities and cities have done the same, primarily utilizing environmental indicators and adapting existing methodologies to the urban setting (COE, 2014). The emphasize is that there is the need of all levels of government to implement appropriate environmental monitoring and information systems that may serve as a foundation for policy choices; of which EA is considered a critical instrument. Adopting an EA system at all levels of government would allow political decision-makers to report to the governed on the environmental results of policies adopted using trustworthy data and regularly updated information on the status of the environment.

2.1.4 Relationship between Environmental Accounting and Environmental Capacity

According to the COE (2004), traditional accounting systems, at least in their original forms, entirely exclude all non-market activities such as housekeeping, subsistence production, volunteer sector activities, and consumption of all environmental services. They make assumptions based on theory that natural resources are endless and that the world's ecosystems have an infinite capacity to absorb the waste products of manufacturing and other human activities. This ignores the idea of sustainability, which is defined as an economic system's ability to keep natural resource endowments intact while not jeopardizing future generations' well-being. It should be noted that GDP, which is commonly used to estimate a country's prosperity, was designed to measure the parameter of economic transactions on the market and cannot account for processes such as natural resource depletion, degradation due to economic activities, or even events such as natural disasters that have significant impacts on natural heritage. Nordhaus and Tobin created the Measure of Economic Welfare (MEW) in 1972, an indicator of well-being based purely on economic benefits.

It included aspects that were not included in the national product, such as the value of leisure time and housekeeping, and reclassified categories such as the types of expenditure incurred for education and public health. Nordhaus and Tobin were successful in estimating a wage disparity as a negative externality, which is required for survival in highly disadvantaged urban environments. Although their index did not include environmental costs, an analysis of the MEW trend from 1929 to 1965 revealed a substantially lower increase than GNP. Other, more recent,

attempts have been made to develop social sustainability indexes capable of replacing GNP and GDP.

In 1992, the United Nations Conference on the Environment in Rio de Janeiro adopted Agenda 21, which called for the implementation of environmental accounting in all nations. The System of Economic and Environmental Accounting (SEEA) was redesigned with an environmental slant in 1995, and all of the present environmental accounting tools were developed and implemented sequentially beginning in 1992. The European Commission emphasized the need for a system of integrated economic and environmental accounting to inform political decision-makers in 1994. Satellite accounts and environmental indicators were chosen because they need less time to develop and implement. The argument over "Green GDP" is currently ongoing, and the theoretical premises and accessible statistics are both subject to change and uncertainty.

Pollution's consequences have become increasingly severe in the previous 10 years, emphasizing the need for environmental accounting tools. The phenomena associated with market globalisation has a direct impact on environmental concerns such as air pollution and the greenhouse effect. This has motivated several states to investigate and test environmental accounting systems, mostly using models and tools developed by the UN, the EU, and the statistics agencies of UN member nations. Towns have done the same, mostly through the use of environmental indicators and the adaptation of urban setting approaches developed for other settings. The UN Conference in Johannesburg also emphasized the significance of implementing appropriate mechanisms for monitoring environmental data that serve as support for political choices. EA improves the chances of charting a sustainable path by bringing the economy and ecosystem closer together, among other advantages.

Scope of EA in relation to EC

The importance of the environment in economic performance is addressed in conventional accounting in part, yet there is a link between the economy and the environment. The SEEA includes environmental issues by separating and expanding all environment-related flows and stocks previously contained in conventional accounting. The goal of this text is to present environmental protection expenditures separately, to expand asset accounts outside economic assets to incorporate environmental assets and changes therein, and to introduce consequences on natural (economic and environmental) assets caused by industrial, residential, and government production and consumption activities as environmental costs incurred by these activities. The physical accounts of ecosystems, the monetary valuation of stocks or inventories of ecosystems and their components, and the three main approaches in physical accounting: Natural resource accounts (NRA), Physical Input-Output Tables (PITT), and Material Flow Accounts (MFA) are all examples of environmental asset accounts. NRA describe the stocks and use of various natural resources in a fairly aggregate manner during the accounting period, Physical Input-Output Tables can be extended to include material flows from and back into the environment, and Material Flow Accounts to measure of flow within the economy as a measure of the sustainability of economic activity in non-monetary terms (usually weight).

2.2 Theoretical Review

2.2.1 Social-Ecological Systems (SES) Theory

The study was hinged on the Social-Ecological Systems (SES) Theory as developed by Elinor Ostrom in the 1990s. Ostrom's study was on determining how communities might manage common-pool resources such as forests, fisheries, and irrigation systems in a sustainable manner. SES theory acknowledges “the interactions and interdependencies between human and natural systems and emphasizes the importance of adaptive governance and resilience in addressing sustainability challenges”. They contend that it provides a framework for comprehending the complexities of sustainability concerns and emphasizes the significance of local knowledge, adaptive management, and polycentric governance systems.

Critics argue that SES Theory does not adequately address power imbalances and social inequalities that can shape resource governance, that it overemphasizes local solutions, lacks integration with other disciplines, has limited applicability in urban contexts, and does not take climate change into account.

The theoretical framework is that study acknowledge existence of interactions and interdependencies between human and natural systems. There is therefore need for properly take stock of and value this natural resources for adaptive governance and resilience for sustainable use of the resources. With these efforts, it would provide a framework for understanding the complexities of sustainability concerns and highlights the significance of knowledge, adaptive management, and governance systems.

2.3 Empirical Review

According to Ramírez *et al* (2021), one of the central elements to monitor the implementation and accomplishment of the SDGs is the production of timely, quality, open, and disaggregated data and statistics that are essential to formulate, implement and evaluate public policy, that will accelerate these goal's fulfilment. Ogunkan (2022), also analysed the importance of environmental management to sustainable development. The study analysed that environmental governance as having three dimensions, viz: legal, policy, and institutional frameworks. The three are holistic, with interconnected and mutually dependent components. Ogunkan (2022), however found Nigeria's frameworks for environmental governance not being effective in addressing the extent of her environmental challenges. The study also established that both legislative and institutional frameworks “must be comprehensive and understandable”. Therefore, “sustainable environmental management necessitates governance systems in which the legal, policy, and institutional requirements of environmental management are viewed as the collective responsibility” of all stakeholders before environmental management system can be productive, effective and sustainable.

Abdulrahman (2021), assessed the function of accounting in attaining sustainable development, as well as the contribution of accounting and the accounting system to environmental preservation and sustainable development. According to the study, in the framework of protecting the environment and minimizing environmental degradation, institutions of all types focus on adopting

or implementing any method that would contribute to environmental preservation and long-term environmental accountability. Indeed, significant efforts and serious attempts have been made to embrace environmental expenses, even though there are many systems and methods of accounting measuring for them.

Enerson and Adegbe (2021), looked at the connection between EAP and environmental capacity for a sustainable economy. The study used an ex-post facto research design. The population consisted of the whole manufacturing industry, with a purposefully selected sample size of 5. According to the findings of the study, economic sustainability and the degree of economic transparency had a large and favourable influence on performance. The study indicated that economic sustainability and the extent of economic disclosures had a substantial impact on the performance of the selected businesses, enhancing their sustainability and going concern status. The research suggested that the FME adopt rules for incorporating environmental accounting and CSR into business reports, and that these recommendations be closely followed.

Ramírez *et al* (2021), argued that despite the prevailing environmental challenges, it is an opportunity that “the need to build back better in a sustainable manner provides the common ground to incorporate environmental issues into public policy”. It was therefore suggested that environmental data and statistics should be positioned as a top priority agenda by appreciating its relevance on monitoring global agreements and articulate stand the policymakers to technical construction exercises.

Marrucci, Daddi & Iraldo (2021), examined the relationship between Absorptive capacity and organisational performance, using 800 Eco-Management and Audit Scheme-registered organisations in Europe. The study validates that Absorptive capacity and firms’ fundamental organisational activities induced the internalisation of an environmental management system (EMS), which accordingly advance the organisation’s overall performance.

Tooranloo and Shahamabad (2020), argued that accounting serves as a tool to address the injustice in the inadequate attention to society and the environment by not only compensating, but also improving environmental issues. Meanwhile, the opportunity is not being fully implemented yet. The study, by building on the existing theoretical foundations and expert opinions, categorised the factors influencing environmental accounting implementation into seven classes, viz; accounting requirements, environmental responsibility, environmental justice, legal requirements, pollution control, organizational factors, and business issues.

Ogbonna *et al.* (2020), investigated the link between environmental accounting and sustainable development in Nigeria from 2007 to 2016. Environmental accounting proxies were oil spillage cost, oil drilling waste disposal cost, and degradation cost, while human development index and human poverty index were sustainable development proxies. For the study, a correlational research design was used. Secondary data was employed in the study. Pearson Product Moment Correlation and basic linear regression methods were used to assess the study Hypotheses test and other data. The findings of this study show that environmental accounting variables had no meaningful link with sustainable development in Nigeria throughout the study period. Degradation cost, on the other hand, indicated a substantial association with both the human development index and the

human poverty index. As a result, the study indicated that environmental accounting did not fully affect sustainable development in Nigeria throughout the study period.

Scarpellini *et al* (2020), identified and assessed the environmental capabilities applied when introducing the circular economy into businesses. Based on the dynamic capabilities' theory, the study analyses different environmental competences that firms apply during this process. Environmental management systems, corporate social responsibility, reporting and accountability and other environmental accounting practices are studied. This study found that the firms' circular scope is positively related with their environmental accounting practices and level of their corporate social responsibility and accountability. According to the study, business organizations will be able to enhance their social and environmental reporting if they understand how to manage the unique competencies that incorporate skills applied to the CE.

Giang *et al.* (2020), provided an overview of environmental accounting for sustainable development, including the strategy, measurement of sustainable accounting, and assessment of the influence of variables on the use of environmental accounting for sustainable development. The research examined data from 80 enterprises in Vietnam from the manufacturing, mining, and processing industries, as well as state and non-state ownership. Multivariate linear regression is used to examine the data. According to research, factors like managers' perceptions of costs and benefits, changes in the environment, features related to the scale of manufacturing and the business operations of enterprises, pressures to disclose sustainable environmental details and reporting, and pressures to reveal sustainable environmental information and reporting all have a significant impact on the environmental accounting for sustainable development.

Stipić (2019), examined EA as a Sustainable Development Strategy focusing on companies in Croatia. The author argued that sustainable development is a business approach that represents the notion of satisfying economic and environmental objectives for the greater good of the society. The study also emphasized that Environmental Accounting is "a subset of modern accounting that provides management information to different hierarchical management levels in order to assess the economic impact of the application of relevant regulations, standards, and protocols aimed at promoting sustainable development".

According to Muralikrishna and Manickam (2017), environmental accounting (EA) is a sort of accounting that incorporates corporate, national, and international levels. It comprises corporate investments designed to reduce environmental losses, as well as all forms of losses caused indirectly by company operations/activities. Over the last 20 years, some 25 nations have experimented with EA. The importance of the environment in economic performance is addressed in conventional accounting in part, yet there is a link between the economy and the environment. The SEEA includes environmental issues by separating and expanding all environment-related flows and stocks previously contained in conventional accounting.

Review of earlier works showed that most of the existing studies focused on EA and SD without serious link with environmental capacity. More so, this existing knowledge were more on countries outside Nigerian border. This current study there set to examine environmental accounting and environmental capacity for sustainable economy in Nigeria.

3.0

METHODOLOGY

The study adopted descriptive survey design using questionnaire to collect data. Population comprised of stakeholders in financial reporting value chain in Nigeria. Of this group, a sample of 103 respondents randomly selected. The data collection was done mainly from structured questionnaire. The instrument was validated using peer review. Data reliability was tested using Cronbach alpha. Collected data was analysed using descriptive and inferential statistics.

Environmental Accounting (EA) was can operationalised by its ability to recognize the costs associated with environmental impacts. Environmental Capacity (EC) was operationalised by focusing on natural systems to absorb those impacts for Sustainable Economy. Sustainability was operationalised by organisations' perception of the ability of EA to absorb environmental cost as well as ability to recover environmental cost.

Model formulation

$$SD = ABS + REC$$

$$SD = \beta_0 + \beta_1.ABS + \beta_2.REC + \mu$$

Where:

SD = Sustainable development

ABS = Ability to absorb cost of environmental impact

REC = Ability to recover cost of environmental impact

β = coefficient or gradient of the slope of each variable

μ = error term

4.0 ANALYSIS AND DISCUSSION OF FINDINGS

Table 1: Test of Reliability

	Cronbach's Alpha	Items
All Variables	.942	24
Ability to Absorb Environmental Cost	.804	6
Ability to Recover Environmental Cost	.805	6
Organizations' Appreciation of EAP for SD	.885	12

Source: Survey (2023)

The results of reliability test (Cronbach Alpha value) in Table 1 (All Variables = 0.942, Ability to Absorb Environmental Cost = 0.804, Ability to Recover Environmental Cost = 0.805, Organizations' Appreciation of EAP = 0.885) revealed that the data for items used to test each variable gave adequate Cronbach Alpha value that is considered reliable enough for generalization ranging from 0.805 to 0.942. Therefore, we can place adequate reliance on inference and generalization from the study.

Bio-data: Analysis of responses suggested that 37.5% (39) respondents were between age of 18 to 39, 43.3% (45) were between 31 and 45, 11.5% (12) were between 46 to 60 and 7.7% (8) were above 60 years of age. This showed that majority of the respondents were in the active working age group. Distribution of stakeholder groups showed that 23.1% (24) were Preparers of Financial Statements, 23.1% (24) were Checkers of Financial Statements (Auditors), 11.5% (12) were Regulators of Financial Statements, 7.7% (8) were Management Staff, 7.7% (8) were Customers and Suppliers, and 26.9% (28) were Academics/researchers/Analysts. Of these people, 11.5% (12)

were working in Banking/Finance sector, 45.2% (47) in Education sector, 8.7% (9) in Manufacturing sector, and 34.6% (36) were in the Service sector.

4.1 Descriptive Analysis of Research Questions

Table 2: Frequency and Percentage Distribution

Items	TT	ST	NS	SNT	NAT	Mean/ SD
Ability of EC to absorb cost of environmental impacts	32	43	21	8		3.9519/
	30.8	41.3	20.2	7.7		0.90714
Ability of the EC to recover cost of environmental impacts	28	28	38	10		3.7115
	26.9	26.9	36.5	9.6		0.97217
Organisations' appreciation of EAP as a tool in EC for Sustainable Economy.	26	37	35	6		3.7981
	25.0	35.6	33.7	5.8		0.88548

Source: Author (2023)

The results in Table 2 showed that 72.1% (30.8+41.3) of respondents were of the view that it is true, 7.7% expressed that it was not true and 20.2% were not sure that EAP is capable of assisting in accounting for the ability of EC to absorb cost of environmental impacts. This suggested that majority of respondents shared the opinion that EAP is capable of assisting in accounting for the ability of EC to absorb cost of environmental impacts for sustainable economy.

The results in Table 2 showed that 53.8% (26.9+26.9) of respondents were of the view that it is true, 9.6% expressed that it was not true and 35% were not sure that EAP is capable of assisting in accounting for the ability of EC to recover cost of environmental impacts. This suggested that majority of respondents shared the opinion that EAP is capable of assisting in accounting for the ability of EC to recover cost of environmental impacts for sustainable economy.

The results also showed that 60.6% (25+35.6) of respondents were of the view that it is true, 5.8% expressed that it was not true and 33.7% were not sure that EAP is capable of assisting in accounting for the ability of EC to absorb environmental impacts. This suggested that majority of respondents shared the opinion that organisations greatly appreciate EAP as a tool in EC for Sustainable Economy.

4.2 Test of Hypotheses

Restatement of the Hypotheses

Ho1: Ability of the EC to absorb of environmental impacts does not have significant effect on sustainable development

Ho2: Ability of the EC to recover from environmental impacts does not have significant effect on sustainable development.

Table 3: Summary of Test of Hypotheses

Model	R	R Sqr.	Adjusted R Sqr.	Std. Error	df	F	Sign.
1	.831 ^a	.691	.685	0.49718	2/103	112.859	.000 ^b
				Unstdzd Coeff	Std Coef	t	Sig.
Model				B	Std. Error	Beta	
1 (Constant)				.534	.224		2.382 .019
Ability of the EC to absorb of environmental impacts				.490	.078	.502	6.284 .000
Ability of the EC to recover from environmental impacts				.358	.073	.393	4.911 .000

Source: Survey (2023)

The result ($R^2 = 0.685$, $F = 112.859$, $P = 0.000$) suggest that ability of the Environmental Capacity to absorb of environmental impacts had 0.885 effect on sustainable development. The P of 0.000 is lower than 0.05 threshold set as significant level. Therefore, the result revealed that ability of the Environmental Capacity to absorb of environmental significant effect on sustainable development in Nigeria.

$$SD = 0.534 + 0.490EC_AB + 0.358 EC_AR + 0.224$$

The model expression of the general result suggests that sustainability development is a function of 0.534 as constant coefficient plus 0.490 of the extent to which environmental accounting is able to absorb of consumption of environmental capacity as well as 0.358 of its ability to recover the consumed environmental capacity including error of 0.224 being accounted for.

Hypothesis 1: Ability of the EC to absorb of environmental impacts does not have significant effect on sustainable development.

Analysis of the individual effects of the components examined showed results for ability to absorb cost of environmental impact as ABS: $\beta = 0.490$, $t = 6.284$; $p = 0.000$. These suggest that the ability to absorb contributed 0.490 to the effect of EC on sustainable development. The p of 0.000 being less than 0.05 showed that the result is significant and we thus infer that Ability of the EC to absorb of environmental impacts had significant effect on sustainable development.

$$SD = 0.534 + 0.490EC_AB + 0.502$$

The model expression of the result of the ability of the EC to absorb of environmental impacts suggests that sustainability development is a dictate of 0.534 as constant coefficient plus 0.490 of the extent to which environmental accounting is able to absorb of consumption of environmental capacity as well as error of 0.502 being accounted for.

Hypothesis 2: Ability of the EC to recover from environmental impacts does not have significant effect on sustainable development.

The results for recovery of cost of environmental impact (ABS: $\beta = 0.358$, $t = 4.911$; $p = 0.000$). These suggest that the ability to recover contributed 0.358 to the effect of EC on sustainable

development. The p of 0.000 being less than 0.05 showed that the result is significant and we thus infer that ability of the EC to recover from environmental impacts had significant effect on sustainable development.

$$SD = 0.534 + 0.358 EC_AR + 0.338$$

The model expression of the result of the ability of the EC to recover from the environmental impacts suggests that sustainability development is a dictate of 0.534 as constant coefficient plus 0.358 of the extent to which environmental accounting is able to recover from the environmental impact with coefficient of error accounted for as 0,338.

4.3 Summary and Discussion of Findings

The study examined the effect of environmental accounting's ability to absorb cost of environmental impact on environmental capacity for sustainable development. Specific objectives are: 1) to examine if the ability of EC to absorb of environmental impacts has effect on sustainable development; and 2) to assess if the ability of EC to recover from environmental impacts has effect on sustainable development. Descriptive survey design was adopted for the study using stakeholders in financial reporting value chain as the population, A sample was purposefully selected on random basis using structured questionnaire to collect data. The results of the analysis found that:

- 1) majority of respondents shared the opinion that EAP is capable of assisting in accounting for the ability of EC to absorb cost of environmental impacts for sustainable economy.
- 2) majority of respondents shared the opinion that EAP is capable of assisting in accounting for the ability of EC to recover cost of environmental impacts for sustainable economy.
- 3) majority of respondents shared the opinion that organisations greatly appreciate EAP as a tool in EC for Sustainable Economy.

These findings from the descriptive analysis are in line with the *a-priori* expectations of the study. They are supported by earlier studies like Nicholls (2020), Nguyen et al. (2020), Nguyen (2019), Rounaghi (2019), Marrone *et al.* (2020) Scarpellini *et al.* (2020), Senn *et al* (2020) and Tooranloo and Shahamabad (2020) that argued that accounting serves as a tool to address the injustice in the inadequate attention to society and the environment by not only compensating, but also improving environmental issues.

The results of the hypotheses found that ability of the EC to absorb of environmental impacts had significant effect on sustainable development. This finding is in agreement with the *a-priori* expectation for the study. The finding is supported by Marrucci *et al.* (2021) which established that Absorptive capacity and firms' fundamental organisational activities induced the internalisation of an environmental management system (EMS). Scarpellini *et al* (2020) also supports this finding where it identified and assessed the environmental capabilities applied when introducing the circular economy in pursuance of sustainability in businesses. It shows that EA is capable of accounting for cost of environmental impacts from human activities so that businesses can efficiently and effectively measure the costs associated with each activity of individual and business on the environmental capacity as the common asset of the nation in form of natural assets.

This measurement and reporting will allow countries to know the extent of depletion and what is needed to replace or enhance these resources. It is this ability that can assure sustainability of the resources.

The study also found that the ability of accounting for the EC to recover from environmental impacts had significant effect on sustainable development. This finding is also in alignment with the *a-priori* expectation of the study. EA is found to be capable of effectively and efficiently measure and report the cost associated with the impact on environmental capacity so as to recover such costs towards sustainable economy. When the nation is able to account for recovery efforts on the environmental capacity, then sustainability can be assured. These are supported by Tooranloo and Shahamabad (2020) that argued that accounting helps to address the inadequacy of attention to environment impact by not only compensating, but also improving environmental issues for organisations sustainable development. See also support in Marrucci, Daddi and Iraldo (2021) which established that capacity absorption of fundamental organisational impact induced the internalisation of an environmental management system (EMS).

Ramírez *et al* (2021) is also in support of the findings here by arguing that it provides opportunity that “the need to build back better in a sustainable manner provides the common ground to incorporate environmental issues into public policy”. Specifically, Ramírez *et al* (2021), “one of the central elements to monitor the implementation and accomplishment of the SDGs is the production of timely, quality, open, and disaggregated data and statistics that are essential to formulate, implement and evaluate public policy, that will accelerate these goal’s fulfilment”. It is therefore proved that the ability to account for these absorption and recovery of costs on environmental capacity that will collectively assure sustainability.

The study by these findings expands the extent of knowledge on environmental accounting, environmental capacity as well as sustainable development by giving a framework for the relevance of accounting for absorption and recovery of environmental impacts of organisational activities with the intent of ensuring sustainability. The results also provide useful insights for practitioners highlighting how organisations in pursuit of sustainability can monitor and emphasise the environmental capacity management by internalising the cost of organisation activities on the environmental capacity.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The study examined the effect of environmental accounting’s ability to absorb cost of environmental impact on environmental capacity for sustainable development using descriptive survey design. It found that the ability to absorb and recover environmental impacts had significant effect on sustainable development. It was therefore concluded that environmental accounting has ability to absorb and recover cost of environmental impact on environmental capacity for sustainable development.

5.2 Recommendations

Based on the findings, the study recommends to major stakeholders as follows:

- i. Environmental accountants: To guarantee a multidisciplinary approach, environmental accountants should make EAP a normal practice, establish thorough methodology, and interact with specialists such as ecologists and environmental scientists.
- ii. Governments: Governments should integrate EAP into national accounting systems and regulatory frameworks, offer financial incentives and support to organizations that adopt EAP, invest in research and development, and encourage collaboration among governments, international agencies, and researchers to develop global standards and best practices for EAP.
- iii. Academics/Researchers: Researchers should conduct additional research to investigate the relationship between EAP and natural systems' ability to absorb and recover from environmental impacts, as well as to investigate potential synergies between EAP and other sustainability frameworks, develop case studies and practical tools, and foster knowledge sharing and collaboration among environmental accounting researchers in order to advance the understanding and application of EAP.

5.3 Contribution to future research

The study contributed to research in the area of sustainability as relates to recognition, absorption and recovery of the costs of environmental impact in Nigeria. It provided basis for further studies and gave empirical evidences for comparative study in future studies.

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