

Analysis on The Relationship Between Green Accounting and Green Design For Enterprise in Nigeria

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ABSTRACT

The study investigates the analysis on the relationship between green accounting and green design for enterprise. Expost-facto research design was used for the study. The secondary data used in the study covered a period of 10 years (2011-2020) and were sources from Business record of vital foam Nig. Ltd, the data were analyzed using multiplied linear regression. From the analysis of the data and test of hypothesis result show green accounting and green design for enterprise have both positive and negative effect on the enterprise but due to external and internal factors. It is on this account that the study therefore recommends that enterprise should make sure they have appropriate and well designed green accounting design to be able to stand the test of time.

INTRODUCTION

Green accounting is a type of accounting that attempts to factor environment cost into the financial result of operation (Sudhamathi and Kaliyamoorthy, 2018). It has been argued that gross domestic product ignores the environment and therefore decision makers need a revised model that incorporates green accounting. Green accounting (also known as environmental accounting) seeks to better measure sustainability by expanding gross measures of national welfare (product, investment, etc) to include non-market values, in particular ones associated with environmental goods and service (Sudhamathi and Kaliyamoorthy, 2018). Green accounting also seeks to incorporate costs and benefits of environmental protection and accounting systems such as profitability. Historically, the idea of green accounting started early 1970 to 1980s USA when it was known as a management tools (Alka, 2016) but the present situation of green accounting evolved from sustainable accounting and has been receiving continuous attention in the academic accounting literature since the early 1990s. Gradually, it spread to other countries like Europe where it concept fully begun to develop fully starting with Norway affected by the publication of Limits of Growth (Meadows et al 2012) with time, ministry of the environment Norway developed statistics for the measurement of nature resources as a tool to better manage natural resource.

Where there is fear that their resource will be depleted due to overexploitation and from there the Danish government adopted it as a result of the oil crisis of 1977 which began to make calculations of energy reserves and saving as well as other countries of the world. Therefore the system of green accounting makes it more easy on life cycle of resources which help to recognize organization or enterprise sustainable. This is to say it try campaigning among corporations, employee, community, and government dealing with effect and benefits of activities to care for the environment in order to enable enterprise growth. Green accounting helps organization help organizations to identifying, collect, calculate, analyze Material and energy-related cost; internalize reporting and using information about environment costs to provide other cost-related information in decision making process, with a view to adopting efficient. Therefore, in this 12th century enterprise are faced with a lot of challenges that threatens their green accounting process and benefits that can ensure that enterprise are able to grow significantly respective of the environment challenges. This why this study is aim at investigating the relationship between green accounting and green design for enterprise.

Statement of The Problem

Environments pollution is one of the problems of the contemporary world at the international and regional levels, even in the developed industrial countries and developing countries like Nigeria. Most countries has adopted different measures to be able to control the effect of environmental problem and the introduction of conventional national income accounting that is meant to address this problem so it does not affect the growth of enterprises of which does not measure the depletion of natural resources and the degradation of the environment which in return have significant negative impact on performance of enterprise. Also, the cost involvement in controlling environment problem, lack of skilled manpower, lack of set rules about the environmental accounting, inadequate environmental accounting standard, low adoption of environmental accounting, no specific principles of environmental accounting have all contributed to serious problem on the management of enterprises that guarantees the growth of enterprises. It is on this note that this study is focuses on investigating the relationship that exist between green accounting and green design for enterprise.

Objective of The Study

The major objective of the study is to investigate the relationship between green accounting and green design for enterprise. Specifically, the study will ascertain;

1. The extent of environmental domestic product on growth of enterprise
2. Impact of net accumulation of enterprise produced economic asset on growth of enterprise
3. Influence of net accumulation of non-produced natural asset on growth of enterprise
4. Effect of final consumption enterprise product of enterprise.

Research Question

To achieve the objectives of the study, the following Research questions are posed to guide the conduct of the study as follows

1. To what extent does environmental domestic product affect growth of enterprise?
2. What impact do net accumulations of produced enterprise asset have on growth of enterprise?
3. What influence does net accumulation of non-produce natural asset have on growth of enterprise?
4. How does final consumption of product affect growth of enterprise?

Hypotheses

The following null hypotheses are posed to test each of the research findings of the study as follows

1. There is no significant effect of environment domestic product on growth of enterprise
2. There is no signification impact of net accumulation of produce enterprise economic asset have on growth of enterprise
3. There is no influence of net accumulation of non-produced natural asset on growth of enterprise.
4. There is no signification effect of final consumption of enterprise product no growth of enterprise.

Significance of the Study

The study will be of theoretical and practical benefits. Theoretically, the study will add to the existing field of knowledge on environmental accounting and close the gap in knowledge that has not being covered by other fellow researchers prior to this time.

Practically, the study will be of benefit to enterprises such as, public and private enterprise and as well as to

future researchers as it will serve as source of research material and reference for future related studies.

REVIEW OF RELATED LITERATURE CONCEPTUAL FRAMEWORK

Srinivasa (2014) defined green accounting as the environmental accounting which account for any charges and as well the benefit that arise from changes to an enterprise goods or methods where change also involve a corresponding change in ecological influences. US Environmental protection agency (2015) opined that green accounting means that environmental accounting of entire domain of accounting for the environment which including financial accounting reporting and auditing as well as environmental management accounting. The Ministry of environment, Environmental Accounting Guidance (2002), also defined environmental accounting as aims at achieving sustainable development maintaining a favorable relationship with the community pursuing effective efficient environment conservation activities. Bureau Meteorology (2013) defined green accounting as the environment accounts which are strongly structured tables that provide organized information for clearly defined decision making purpose for enterprises. Therefore, from the above definitions, green accounting can be said to be the accounting which considers environmental factors that may affect the activities to an enterprise and as well impact on their performance and growth.

Theoretical Framework

The work is anchored on two theory which are, Environment theory of Florence Nightingale proposed by Johnson and Webber (2012) and Technological theory propounded by Marshal McLuhan in 1999. Environmentalist theory of Florence Nightingale proposed by Johnson and Webber (2012): This theory posit that environmental external conditions influences and affect the life and development of an organization and organism as well are able to prevent, suppress or contribute to growth or death of the enterprise or organism. This theory assumed that providing a suitable environment is vital for the recovery of and growth of organization, hence it is essential to provide and maintain an environmental that is favorable to facilitate the growth and sustenance of any enterprise. The use of this theory in this study is significance since the environmental external condition has great impact on the performance of the organization which will always reflected in the organization environmental accounting and the performance and growth of any organization is highly dependent on the provision on the conducive environmental condition that will enable an enterprise to grow. And for the fact that the study also focuses on the relationship between green accounting and green designed that will contribute to the performance and growth of enterprises. Technological theory: This theory was propounded by Marshal McLuhan in 1999. The theory state that technology advancement is influenced by the behavior of human within a given society with their various cultures. This theory assumes that as human behavior changes from day to day as result of environmental factor, hence leading to advancement in technology that suit the current environmental changes. This theory also suits this study since environmental positive changes will lead to a corresponding influence on the performance and growth of an organization as well environment design that could make a firm suit to his current environment.

Theoretical Exposition

The review of related literature is discussed under the following subheading;

The impact of green accounting on enterprise

As a result of corporate social responsibility (CSR) of enterprises, green accounting become very important, of which production must incorporate environmental production with production of low cost together with low pollution products (igbodoet,2018). The adoption of green accounting increases expenditure, of which it is necessary to affect the product design to solve this problem. The reason for change in product design is derived from impacts, which are using less resources to get more products, the

reduction of environmental expenditure by minimize pollution, utilizing green innovation to actualize competitiveness, plan good production as a target for product design (Hendratno,2019). Globally, the small, micro and medium sized enterprise (SMME) sector that always considered green design generates substantial employment and economic output. These dynamic enterprises contribute to economic development in several ways: converting innovative ideas into economic opportunities, revitalizing social and productive networks, and increasing productivity. Research has shown economic growth and as well as good environmental domestic product in a suitable environment lead to growth of enterprise (Heather et al, 2012). In both developed and developing countries like Nigeria, small and micro enterprises, account for the vast majority of enterprise. Because developing countries are typically more focused on small-scale production, the share of overall employment by small and micro enterprises tends to be higher and good green accounting design that provide comfortable environment for enterprise will affect the growth of enterprises positively (Deswanto and Siregar, 2018). According to Ayyagari et al (2017) promotion of the SME enterprise sector through appropriate environmental green design is a core element to foster employment, economic growth, and poverty alleviation. Beck, Demircug-kunt, & Levine (2015) also found a large SME contribution to employment. This is why World Bank (2014) stated that the contribution of enterprise in suitable environmental in developing countries have positive significant effect on growth of the enterprise. Beck et al. (2015) found a robust relationship between the size of the SME sector and economic growth; the latter include their determinants an aggregate index of the overall business environment. However, World Bank (2013) suggested that regressions for reverse causation erode the significance of the relationship. Subsidies to SMEs are thought to be a poverty alleviation tool because the promotion and development of small businesses may create scenarios for low income people to participate in the economy.

Impact of net accumulation of enterprise economic asset and net accumulation of non-produced natural asset on growth of enterprise

Traditional accountings introduce terms like fixed, current, Deplete able, normal and even lucky assets. But due to environmental sciences it provides the natural and environmental assets. In the traditional balance sheet one can realize that the majority of assets are manmade assets and, in some cases, intangible assets such as (petroleum, trees e.t.c) despite the full control over such assets (Igbodoet al, 2018). For instance, a hotel overlooking a bay or a river will have a competitive advantage and thus more revenues compared to other hotels downtown in a crowded area. The researcher believes that a separate item for environmental assets should be in the financial statements especially for these organizations that are dependent on environment and natural environment stock in generating its revenues (Puritan, 2018). In addition, nowadays in many countries it is familiar to see a pollution bond (environmental asset) possessed by an organization that may not be in need of it any longer as a result of complying with environmental regulation so it sells the bond to other organization that need it (igbodoet,2018) . Therefore, net accumulation of asset of an enterprise can be in form of the following environment asset or natural asset.

Environment Assets: This represents the environment asset possessed by an organization as a result of environment protection regulation and /or according to environmentally voluntary activities (Hendratno, 2019). In fact, such assets are parts of man-made assets such as environmental protection equipment, pollution bonds. Etc. It is worth mentioning that they might be fixed assets or current assets. Even that the same assets may be considered fixed in one organization while current in the other. Hence, distinguishing between natural asset and environmental asset in category is vital (Lako, 2020).. Showing natural assets in a separate category is important as those assets represent the real wealth in some organizations, governorates, sectors, countries. Besides that, they are the wealth of the next generations. Showing environmental assets in a separate item gives an idea for all concerned parties about the value of environmental asset and environmental capital for environmental protection at any level (company, sector, governorate, nation-wide) (igbodoet,2018).

Thus, green accountings distinguish between environmental and natural asset and also seek to answer questions like what is the value of the environmental assets? What is its return? Does it value increase or decrease? And so forth.

Efforts of green design in environmental protection

Green design has been in existence for over 30 years, it has been the total agreement in the whole world that green design serve as aid for environmental protection like clean production, of which the basic requirement for green design is to produce products without toxicity and involvement production without pollution of the environment (Lako, 2020). Also green design has a requirement of use life cycle valuation to evaluate the environmental impact, design and adopt recyclable renewable resources, leaving exhausting the scarce resources of the earth (Marota, 2021). The essence of all these is to enhance performance that will be shown in the green accounting. Environmental difficulties on business management issues, auditing, accounting, and disclosure system must mainly concerned by accountants be the main custodians and bearer of financial development(Khoirina, 2021). It becomes norm that the environmental degradation costs are due to industry issues that must be internalized into the company's account as far as possible(Hendratno, 2019),this shows that green accounting has a relationship with green design.

Empirical Review

R de Villiers & van Staden (2006) utilize annual report content analysis to investigate the environmental disclosure practices of companies operating in South Africa. They conduct a content analysis of more than 140 corporate annual reports over a nine-year period in order to identify the trends in environmental disclosure by South Africa companies over time. Their results indicated a reduction in environmental reporting after an initial period of increase, for both mining companies was bigger than for the top 100 industrial companies. The decrease for mining companies was bigger than for the top 100 companies, both overall and when the results were divided between specific and general information classes. The disclosure of both general and specific information increased from 1994 to 1999; disclosure of specific information then declined by five times more than the decline in disclosure of general information. Jones (2010) developed a multi-layered theoretical model to investigate environmental accounting and reporting these were severe environmental dangers; corporate responsibility; new relationship between industry and environment; measure industry's impact, and disclose and report impact stakeholders. The author developed several implications from the acceptance of this theoretical model for organizations and accountants.

They found two significant result. First, at the general level, given the security of the environmental problems, it would seem prudent for managers and accountants to take immediate action to address these threats. Second, the traditional accounting paradigm with its narrow focus on accounting numbers does not capture the environmental consequences of organizational activity. Third, as part of innovation and experimentation there is a continued need to explore potential alternative monetary and non-monetary valuation systems. Finally, the theoretical framework implies that as part of their discharge of their stewardshipq function organizations should disclose their environmental performance to stakeholders. khalid et al(2012) investigated the level of Environmental Management Accounting (EMA) implementation in companies within environmentally sensitive industries in Malaysia, as well as gain insights into pressures for implementation. The authors found that the elements of environmental-related management accounting within some of the organizations in which interviews were conducted. Implementation was driven by a motivation to reduce costs rather than environmental conservation. Apart from those companies reactions to environmentally sensitive workplaces, procedures and processes in the companies with which they are in business. Andrew & Cortese (2011) explored the dominant environmental discourses that can influence and shape carbon disclosure regulation. They found that carbon-related disclosures have in last five years, and many of these disclosures remain voluntary. The paper considered both the construction of self-regulated

carbon disclosure making. The authors focused on the carbon disclosure project (CDP) and the use of the greenhouse Gas (GHG) protocol as a reporting model within it. Annex & Engelhard (2011) used a predictive Bayesian model confirmed for the assessment of highly uncertain environment and contingent costs.

In environmental accounting methods often ignore or inadequately represent large but highly uncertain environment costs and costs conditioned by specific prior events. The predictive Bayesian approach presented generates probability distributions for the quantity of interest rather than parameters thereof. A spread sheet implementation of a previously proposed predictive Bayesian model, extended to represent contingent cost, was described and used to evaluate whether a firm should undertake an accelerated phase-out of PCB containing transformers. Noodezh and Moghimi (2015) Investigate the relationship among return on capital employed(ROCE) and environmental accounting, earning per share(EPS), net profit margin(NPM) as secondary knowledge obtained from the annual report and account of fourteen(14), voluntary selected companies quoted on the Nigeria stock exchange market, using mistreatment multivariate analysis, the result found was that environmental accounting incorporates an essential relationship with the assorted variables utilized in activity company performance. Pandey (2016), the study mainly seeks to prove whether there is a significant correlation between environmental costs experienced by companies and profitability. The study using secondary data obtained from company annual reports for a 5-years period, from 2011-2015. return on capital employed(ROCE) was use to measure performance, the data used was the selected companies environmental cost. The study employed a regression analysis based on the sample data and analysis, which found that there was no critical connection between the companies environmental expenditure and its financial performance. Bassey et al.,(2018) scrutinized the effect of reporting and accounting of environmental performance with reference to oil and gas companies operating in Nigeria. Pearson product moment correlation coefficient was use to conduct the research. Unfortunately, environmental costs have a significant relationship with company profits. The study concludes that environmental cost management totally influences company profits and improved firm performance.

METHODOLOGY

Research Design

Expost-facto research design was used for this study. This research design is one in which a few groups of data is collected from already existing data which is a reference that can be used as representation of large group of study {Nworgu, 2015}.

Nature and Source of Data

Secondary source of data was used for the study. The data was sourced from directly from the enterprise business record. The enterprise used is vital foam Nigeria LTD and poly foam Nigeria.

Method of Data Collection

The data used in the study covered a period of 10yrs (2011-2020) and were sourced from the enterprise business record. The data collected were coded in environmental domestic product (EDP), Net accumulation produced enterprise asset (NAPA) net accumulation of non-produced natural asset (NANNA) and final consumption of enterprise product (FEP). This green accounting variables were used to check the effect it has on growth of the enterprises.

Method of Data Analysis

The data collected were all subjected to multiple linear regression to ascertain the effect of the above

variables on the growth of enterprise.

Model Specification

The following regression model specification is used in the study as a guide that will be to assess the effect of the green accounting design variables for enterprise on their growth of enterprise. The model is as follows.

$$\text{PROFIT} = (\text{EDP} + \text{NAPA} + \text{NANNA} + \text{FEP}) \dots \dots \dots 1$$

$$\text{PROFIT} = n_1 (\text{EDP} + n_2 \text{NAPA} + n_3 \text{NANNA} + n_4 \text{FEP}) \dots \dots \dots 1$$

Decision Rule

Null hypotheses will be accepted when $p < 0.05\%$ probability level. But when $p < 0.05\%$ probability level, null hypotheses will be rejected.

Presentation and Analysis of Data

Data Presentation

Table 1: Regression Analysis for vital foam Nigeria Ltd

Variables	Coefficient	std. Error	T	P
Constant	1.278	1.487	0.859	
EDP	0.0504	0.256	0.197	0.852
NAPA	-0.278	0.375	-0.743	0.491
NANNA	-0.0878	0.379	-0.232	0.8626
FAP	1.042	0.333	3.127	0.026

0.05% Level of probability

$$\text{PROFIT} = 1.278 + (0.0504 * \text{EDP}) - (278 * \text{NAPA}) - (0.0878 * \text{NANNA}) + (1.042 * \text{FAP}) \quad N=10$$

R= 0.849

Rsqr = 0.721

AdjRsqr=0.498

Standard Error of Estimate = 0.892

Table 1: this table shows that environment domestic product account for 5.04% growth for vital foam, net accumulation of non-produced natural asset account for about 1%. The Rsqr value of 72% as seen above indicates factor such as internal or external come into play but if external factors or internal factor comes into play it will have some level of effect on the growth of the firm as indicated by AdjRsqr value of 49%. The standard error of estimate which is 0.8 approximately 1 and greater than zero is a clear indication that the model used for the study is reliable for making inference.

Table 2: Regression Analysis for poly foam Nigeria Ltd

Variables	Coefficient	Std. Error	T	P
Constant	0.740	1.303	0.568	0.595
EDP	-0.478	0.420	- 1.139	0.306
NAPA	-0.136	0.585	- 0.232	0.826
NANNA	0.502	0.707	0.710	0.509
FAP	0.854	0.592	1.442	0.209

0.05% Level of Probability

$$\text{PROFIT} = 0.740 - (0.478 * \text{EDP}) - (0.136 * \text{NAPA}) + (0.502 * \text{NANNA}) + (0.854 * \text{FAP}) \quad N=10 \quad R= 0.893$$

$$R_{\text{sqr}} = 0.797 \quad \text{Adj}R_{\text{sqr}} = 0.634$$

Standard Error of Estimate = 0.545

Table 2 despite that environmental domestic product account for 40% negative effect on the growth of the enterprise, net accumulation of non-produced natural asset account for enterprise product. This result implies that over the period of ten yrs the experienced value of 79% is an indication that over the period, that the firm experienced a little decline in rate of growth as seen in the AdjRsqr value of 63% standard error of estimation value of 0.545 which is above zero is also an indication that the model used for reliable for inferential decision.

Test of Hypotheses

Table 3: Analysis of Variance (ANOVA)

	DF	SS	MS	F	P
Regression	4	5.821	1.455	4.03	0.056
Residual	5	1.484	0.297		
Total	9	7.305	0.812		

0.05 % level of probability

Table 3 indicated at 0.056 probability level, there is a statistical effect of green accounting design on the growth of enterprise but the effect is not statistically significant. Therefore, at this level of significance null hypothesis is rejected.

DISCUSSION OF FINDING

The findings of the study shows that green accounting and green design for enterprise have both positive and negative effect on the enterprises. This effect may be due to external factors such as environmental domestic product of an enterprise, net accumulation of non-produced natural asset account, net accumulation produced enterprise asset and final consumption of enterprise product. The finding as well showed that enterprises that effectively manage their environmental domestic, net accumulation of produced enterprise asset, net accumulation of non-produced natural asset and final consumption of enterprise product. Stand high chances of growing since the firm balances their internal factors and external factor necessary for their production and survival. This findings ass well corroborates with the findings of Heather et al, (2012) who in their research has shown that countries which have high start-up rates of such enterprises benefit form higher economic growth and as well god environment domestic product in a suitable environment leads to growth and of enterprise. It also agree with the finding of Ayyagaiet al (2017)

promotion of the SME enterprise sector through appropriate environment green design is a core element to foster employment, economic growth and poverty alleviation. Furthermore, the findings of this study is also in consonant with the findings of Heather et al, (2012) who also in their study in five African countries found that these small scale businesses generate nearly twice the level of employment that registered large scale enterprises and public sector do.

Summary of Finding

From the study, it is evident that in modern age, there is a need to balance environmental factor with enterprise factors of production through effective green accounting design, this will ensure that enterprises are able to survive in any given competitive environment for more better and efficient production. It's also necessary that enterprise put into consideration the key variables that could impede on their growth and match this with effective green accounting design suitable for the organization and the environment.

CONCLUSION

It conclude that there is significant effect of those variables on the growth of enterprise if no other factors such as internal or external comes to play but if external factors or internal factors comes into play it will have some level of effect on the growth of the firm.

Recommendation

Therefore, it is recommended that enterprise should make sure they have appropriate and well-designed green accounting design to be able to stand that test of time.

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APPENDIX

THN YEARS DATA FOR VITAL FOAM NIGERIA LTD

YEAR	EDP (%)	NAPA (%)	NANNA (%)	FAP (%)	PROFIT(000)
2011	3.2	5.6	3.3	2.5	230,200
2012	3.4	4.1	2.3	3.1	873,485
2013	4.1	3.0	2.8	3.7	614,162
2014	6.8	5.0	2.9	4.1	926,312
2015	5.7	5.7	4.1	5.5	489,456
2016	4.1	7.1	4.3	6.1	522,757
2017	7.1	6.4	3.8	5.0	550,430
2018	7.0	6.4	5.6	5.3	489,371
2019	7.3	7.1	6.1	4.5	1,471,187
2020	8.0	7.1	6.5	5.6	2,767,630

Where

EDP=environmental domestic product

NAPA=Net accumulation of enterprise produced economic asset

NANNA=net accumulation of non-produced natural asset

FAP=final consumption enterprise product

$N_1 n_2 n_3 n_4 = \text{constant}$

TEN YEARS DATA FOR POLY FOAM NIGERIA LTD

YEAR	EDP (%)	NAPA (%)	NANNA (%)	FAP (%)	PROFIT(000)
2011	2.1	3.1	2.8	3.1	315,060
2012	2.5	3.2	3.1	3.5	411,230
2013	4.2	3.8	4.4	4.5	390,080
2014	3.1	4.0	4.4	5.0	520,010
2015	3.9	4.5	4.8	5.5	610,200
2016	6.1	4.4	5.6	5.9	530,310
2017	5.0	5.1	5.3	6.1	490,450
2018	6.5	5.3	6.2	5.9	530,320
2019	6.0	3.9	6.3	5.5	510,342
2020	6.0	4.8	5.9	6.5000	571,657