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APPROACHES IN NATURAL STOCK VALUATION IN ENVIRONMENTAL ACCOUNTING AND NATIONAL INCOME ACCOUNT: THE NIGERIAN EXPERIENCE

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Abstract

Environmental accounting is a new concept the field of financial accounting. Basically, the concept states that the value of natural assets should be calculated and added to the gross domestic product of a nation. It further state that corporate entities should take care of environmental degradation that happen in the course of carrying out their economic activities. Among the objectives of the study is to identify natural stock valuation method and examine the extent to which multi-national entities operating in Nigeria has adopted environmental accounting. The findings show that environmental accounting is still at infancy stage in Nigeria

Keywords: *Environmental accounting, Natural capital, Environmental cost, Environmental expenses, National income account.*

INTRODUCTION

Recent studies have shown that there is a move toward man living in a green environment globally. Concern for a clear environment came to the fore on the realization that economic activities of corporate entities have been harmful in one way or to the other to the environment thereby leading to problems such as: Ozone layer deflection, climate charge, air pollution water pollution, soil degradation etc. One of the strategies that has been employed by societies to make the entities responsible, solve the problem they help to create, is the adoption of environmental accounting.

According to Islam (2018) environmental accounting could be defined from corporate or national perspective. At corporate level, environment accounting is a set of organizational activities that deals with the measurement and analysis of the environmental performance of corporations and the reporting of such results to concerned groups, both within and outside the corporation while at national or regional level, environmental accounting is that branch of accounting dealing with activities, methods, recordings, analysis, and reporting of environmental and ecological impacts of defined economic system.

Similarly, Hussain, Halim and Bhuiyan (2016), define environmental accounting as "a field that identifies resources use, measures and communicates cost of a company's or national economic impact on the environment". Both definitions point to one thing; the need to properly identity and access impact of economic activities on the environment and to clean up the environment and bring it up to the form most suitable for human habitation.

The general objective of this study is approaches in natural stock valuation in environmental accounting and national income account while the specific objectives are to: (i) identify natural stock valuation methods (ii) compared the relationship between the environmental accounting and system of national account and (iii) examine the extent to which multi-national entities operating in Nigeria has adopted environmental accounting.

It has been argued that there is a direct relationship between economic activities and environment, because all economic activities take place in an environment. The environment itself has natural resources which serve as an input for production. While the environment also serve as a source for absorbing the unwanted waste of industries. Most environmental assets are not captured in national account of nations because they cannot be quantified in financial term. Whether we like it or not, services provided by the environment are economic assets.

Environmental assets are natural resources which nature has bestowed on the environment. For example, the aquatic lives of a particular zone or region, the wide lives- different species of animals such as lion, tiger, cobra, python, hyena etc. Also the soil has two types of environmental assets. First is the minerals deposits of any kind found in a soil and second is the quality of the soil itself. A soil that is rich in nutrient will produce cash and food crops in large quantity while the soil that is deficient will produce poor harvest, no matter the effort of the farmer.

Economies differ from one another in terms of natural resources deposit. Countries that have high deposit of natural resources with the right technology to mine the natural resources are supposed to be rich countries, when compared with countries with less deposit of natural resources.

Nigeria is one of the economies with so much natural assets, second only to the United States. However, the natural assets or resources have not translated into high Gross Domestic Product (GDP) for the nation due to the nation inability to produce the right technology to complement the abundant natural resources.

Given the level of technological development in the natural resources industry, Nigeria is considered a primary producer, poor and a developing nation thus this study hinges on the need to properly evaluate natural resources which constitute environmental asset. While the inclusion of the environmental assets as part of the items in a nation's current or non-current asset in national accounting of nations requires adequate attention.

Not much attention has been given to this important aspect of accounting before now. According to united Nation (2003), environmental accounting is a field of study, where active research and investigation is till on going.

REVIEW OF RELATED LITERATURES

Environmental accounting is a relatively new concept in the accounting discipline. In the context of the developing nations, especially Nigeria, there are little or no known details study on environmental accounting, hence all the literature reviewed are foreign. Some of the previous studies in the subject matter are analyse, classified and discussed as follows: Masud, Bae and Kim (2017), studied the environmental accounting reporting pattern of quoted banks in Bangladesh for the period 2010 to 2014. The authors argued that all the banks studies showed great concern for the environment, by including information about green banking and renewable energy in their annual report. Similarly, most of the banks financed environmental projects at zero interest rate. They further disclosed that reporting environmental related issues by the banks increased from 16 percent in 2010 to 83 percent in 2014. They further argued that the importance of environmental accounting cannot be under-rated, given the fact that in 2012, an estimated 6.5 million deaths, i.e. 11.6 percent of all global deaths were associated with pollution of the environment. However the authors did not disclose whether expenditure on the environment (Natural resources) is included in national account of Bangladesh and the method for accounting for them.

Lia, Salminen, Jappinene, Koljonen et al (2018) examined system of national accounting in Finland. They argued that the gross domestic product (GDP) should be adjusted to accommodate the record of natural resources over consumed and its negative effect on the environment, in the form of pollution. In a nut shell they argued that natural resources of a nation are types of wealth which should be included in the calculation of national accounting income of a nation. According to the authors, one of the assets of a nation is natural capital. In their word, "natural capital is an environmental asset that provides benefits to humans". Conversely, ecosystem assets are thus considered as a type of natural capital. The authors opines that Finland has a well-developed system of environmental accounting which provides data on raw materials consumption, energy supply and use, waste generation, greenhouse gas emissions and other environmental business related activities and protection. In spite of the robust accounting system, natural resources and environmental accounting system, is not yet part of Finish national accounting system operated by Finland Department of Statistics.

Writing on the same subject, Rakos & Antohe (2014), argued that the term environment was used in the beginning of the 19th century in its biological meaning (referring to natural environment that surround livings things). Later geographical interpretation was attached to the term. Further expansion of the term to include variety of definition occurred in the 21st century. According to the authors, environmental accounting is a global concept which seeks to identify, analyse and record the impact produced by economic activities on the environment. Two concepts: environmental cost and environmental expenses were introduced by the researchers. The formal they observed include all expenditure incurred in extracting/manning or exploring the natural resources deposited in the environmental. Also all expenditure incurred in preparing (clearing of site, construction of building and installation of machines in the site) the site for productive purposes is regarded as environmental cost. These costs should be capitalized in the books of the entity that derived the environmental benefits.

On the other hand environmental expenses refers to all necessary financial expenses incurred or to be incurred in order to restore the environment to its formal natural habitation before degradation took place as a result of economic activities of man. These set of expenditure should be written off in the books of the entity.

Thus, the authors whose discussion is based on the background of Romania economy did not state whether natural capital is included in the calculation of natural income account in Romania, neither did they state the approach or method adopted in the calculation if any. However they argued that the adoption of environmental accounting was imposed on the country by the European Union. The country in turn imposed it on entities operating in the country.

In a related development, vinayagamoorthi, Murugasen et al (2012), asserted that there is an increasing awareness about the important of environmental management accounting as a decision tool in India. They opines that reporting environmental issues will impact on the entity in the following ways: increase investor's confidence, ensure lower cost of capital, lead to appreciation in stock value and an increased interest of institutional investors thereby helping the entity in taking effective internal and external decisions.

They further argued that while environment accounting (EA) is concerned with both internal and external decision making of an entity, environmental management accounting (EMA) is concerned only with the internal decision making aspect of an entity. Environmental management accounting is a new concept in India, and literature on it is still at infancy stage. Environmental cost has assumed major cost item in the looks of corporate entities, such that it can no longer be sub-merged with other expenditures. Yet many entities still need external help in the treatment of EMA cost because the skill required is not readily available in India, they concluded.

METHODOLOGY

This study is based purely on the Nigerian background. A counting with so many mineral deposits yet remained under-developed. Personal observation of major firms such as Shell Petroleum Development Company and Seplat Oil Drilling Company was adopted in the study. Qualitative data were source from primary source. While extensive survey of content analysis of related literatures were under taken.

DISCUSSION

Environmental Accounting – NRA Approach

Definition: Environment accounting could be approach from two different perspectives one is the natural resources approach while the other is the system of National Accounts (SNA) approach.

Natural Resource Accounting (NRA) definition: Environmental Accounting is a field of study which seek to acknowledge the contribution of natural asset to the income generation potentials of a private or public organisation.

It seeks to or place monetary value to the individual natural assets that make up the statement of financial statement.

Environmental account- SNA approach

Similarly, SNA defined environmental accounts as a branch of national income account. The formal is concerned with measuring the natural environment and the economic activities that take place in the environment in monetary term. It is important to place monetary value on the environment because all productive activities such as: manufacturing farming, quarrying, drilling, refining etc. takes place within an environment. These activities impact negatively on the environment either by depleting the minerals content in the land or by destroying the nutritional content of the land.

In this study the word environment and natural environment means the same thing. By definition environment encompasses the land i.e. the soil, nutritional values and mineral deposits, the sea (including the aquatic lives) and the air.

As a result of human activities the environment is constantly affected. Therefore it is important to know the value of the environment at the beginning and at the close of an accounting period. Such assessment will reveal the increase or decrease in the value of the environment as an asset within the period.

Seve (2002), posits that among the services provided by the environment to society are inputs to production process, such as waste disposal services provided by water and air, and outputs derived directly from nature such as recreational and ecological services (e.g., climate, soil protection, even water flows, biodiversity conservation and carbon sequestration). Because these services are not normally bought and sold at market prices, they are not measured by conventional economic accounts. Services of the environment and natural resources will in fact have economic value if they are scarce in an economic sense, i.e., when demand for the services is limited by available supply. If scare services were traded in markets, they would have observable market prices, and thus would be included in the conventional accounts. However, they are typically not marketed in spite of their economic value, either because property rights to the assets have not been established or because the “owner” of the property right (often the government) chooses not to act as a seller of the services.

Nordhaus (1999) defined environmental account as “expanding the National Economic Accounts to include the environment. National account on the other hand has to do with the calculation of the total goods and services produced in a country. In ordinary level economics, it was stated that there were three approaches in the calculation of national income. These are the income approach, output approach and expenditure approach.

The basic purpose of national income accounts is to provide a comprehensive view of a nation’s economy, and in principle, these accounts measure the nation’s total income and output. The most important indicator in national economic accounts is gross domestic product (GDP), which is a measure of a nation’s total output of goods and services and the total income generated by that output. However, GDP, as well as other indicators derived from it, measures the performance of an economy on the basis of prices from marketplace transactions. This market price basis for measuring values constitutes a weakness of conventional indicators from the standpoint of environment and natural resources. In fact, while interactions between economic activity and the environment have become increasingly evident, indicators like GDP ignore such interactions. On the one hand, GDP measures economic performance on the basis of market transactions; on the other hand, economic performance benefits from a number of services provided by the natural environment, which are not transacted in market, and therefore not captured by GDP or other conventional indicators.

Similarly, Kumar (1993), asserted that Governments throughout the world use national income accounting as a means of monitoring their economic progress. National income accounting originated in the United Kingdom in the 1930s to meet the needs of government decision makers for statistical information with which to assess policy responses to the Great Depression. The United Nations Statistical Office (UNSO) has established a framework of recommendations and principles on procedures for calculating national accounts. This framework is referred to as the System of National Accounts (SNA).

Over the past 60 years, there has been increasing awareness of the interactions between societies and their natural environments. This awareness has been sharpened by concerns about resource scarcity, environmental degradation and global environmental issues such as climate change, and has motivated attempts to expand the scope of national accounting systems by including environmental assets and services. This is part of a large movement to develop broader economic indicators focusing primarily on environmental quality, but also on other non-market activities, such as household production and the use of leisure time.

More specifically, in many African countries, as a result of population growth, persistent rural poverty, and other factors, the degradation of a number of environmental and natural resources, such as forest cover, arable soils, pastures, inland fisheries, and water flows has attained such extreme proportions, that the economic growth capabilities of many nations are already being affected. However, the economic effects of these trends are not reflected in the national accounts which provide the essential data base on which most economic policy decisions are made. Also not represented in the national income accounts is household production, a major component of many (and perhaps most) African economies.

Relationship between Environment Accounts and System of National Accounts (SNA)

It has been argued that traditional measurement of economic activities such as Gross Domestic Product (GDP) adopted by system of National Account does not reflect the true economic position of nations. Proponents of this view assert that cost associated with degradation of the environment and depletion of natural resources values are excluded from the calculation of GDP. Similarly Harris and Frasei (2002) opine that under SNA natural variables which contribute to the welfare of the citizens are not included in the calculation of national income. The conclusion therefore is that National Income Accounts in its present state as constituted by system of National Accounts is a narrow and misleading view of countries accounts.

"Hence environmental adjustments to the SNA and more broadly the introduction of Natural resource Accounting (NRA) are advocated on the basis of removing the current biases (Harris and Fraser 2002).

On the contrarily, environment Accounts also known as Natural Researches Accounting is broader in scope. It takes into account the value of national resource stocks in the calculation of national income account. When there is depletion in the value of natural asset as a result of usage over time, adjustment is made in the national account to reflect such changes.

Comparatively, Environmental accounts are adjudged a better measurement of a country's wealth because it takes into account the various sources of a country income, especially natural resources unlike SNA whose calculation of national income only involves activities that can be placed on monetary or market value. In effect, natural stock who's deflection contribute to current income flow is regarded as an income with our corresponding adjustment in the national account as a result of the loss in value of the national asset.

Approaches to Environmental Accounting

There are two approaches to environmental accounting. The first one is by United Nation statistical division known as System of National Account (SNA). According to Kumar (1993), the first official SNA was developed by UNSO in 1953. The current SNA records a nation's production, consumption, and capital accumulation, and the final distribution of goods and services among households, businesses, institutions, government, and foreigners, all in terms of monetary flows. Most nations follow the UNSO guidelines to a certain degree, although few compile their accounts to the full extent of the current SNA model. National accounts, and the economic indicators that they spawn, are very powerful tools for decision makers in setting national-level policies and planning for the future. These policies, in turn, influence economic and social decisions throughout all levels of societies. The second one is the one developed by United Nation and other commissions. It is known as System of Integrated Environmental and Economic Accounting (SEEA 2003).

Assets Accounts

Web Finance (2016), define assets as: The net value held by a business of such things as liquid funds, investments, account receivables, unsold inventory, real estate, machinery & valuable intangibles. Each of those item categories can be summed up for a business to create its own asset account. Current asset accounts contain assets held for less than one year, while long term asset accounts contain those held for more than one year.

Jan (2014), asserted that, assets are those resources owned by a business which benefit its future operations and are convertible to cash (cash itself is also an asset). Examples are cash, land, building, vehicles, receivables, etc.

For the purpose of this discussion, assets are resources or things of value that are owned by an entity. Some examples of assets which are obvious and will be reported on by an entity's statement of financial position includes, cash, accounts receivable, inventory, investments, land, buildings and equipment.

Asset Accounts – SNA Approach

According to SNA, there are two approaches to determine the value of environmental assets. The first is the application of statement of financial position. Assets at the beginning of the accounting period is compiled and checked against the value of assets at the end of the period. The second is known as "other changes in assets account". This method incorporates flows that cannot be regarded as transactions such as discoveries of petroleum and other mineral resources.

Environmental Assets

System of National accounts (1993), classified assets into produced and non-produced. Produced assets are those which come into existence as products resulting from economic production. While a non- produce assets are those that occur as a result of purely natural processes e.g. tin Colom bite, crude oil and gas.

SNA (1993) defined environmental assets as: entities over which ownership rights are enforced by institutional units, individually or collectively, and from which economic benefits may be derived by their owners by holding them, or using them over a period of time.

These benefits relate either to primary income derived from the use of the asset or simply to the fact that the asset in question represents a store of wealth which can be exchange for another asset (including cash) which in turn fulfils one of these two conditions.

On the other hand SEEA (2003) gave the following definition: Natural resources assets are those elements of the environment that provide use benefits through the provision of raw materials and energy used in economic activity (or that may provide such benefits one day) and that are subject primarily to quantitative depletion through human use. They are sub- divide into four categories: mineral and energy resources, soil resources, water resources and biological resources.

Valuation of Natural Resources Stock

The method of assets valuation in SNA and SEEA are similar. Both recommended the use of market value of the assets. This is usually possible for produce assets and land.

Where the market price do not exist, the next choice is to estimate the net present value of future benefits accruing from holding or using the asset. If the value of the future benefits did not at least equal the market price, the asset would not be a cost-effective purchase.

Value of the Stock Level

When there are no direct market prices for non-produced asserts, it is necessary to estimate the value using net present value techniques applied to the resource rent. Once the resource rent of an asset has been determined, three further steps are necessary to determine the stock level of the asset:

1. For how many more years into the future will the asset generate economic rent?
2. What will be the pattern of decline (if any) in the economic rent?
3. What is the appropriate value of the discount rate that must be applied to earnings in future years?

A generic asset account for physical asset

Opening Stock	₦	
Increase in stocks:		
Due to economic activity:	XX	
Due to regular natural processes:	XX	
		XXX
Decreases in Stock		
Due to economic activity	(XX)	
Due to regular natural processes	(XX)	
Due too natural disasters (net decrease)	(XX)	
Changes due to economic reclassification	(XX)	
		(XXX)
Closing Stock		XX
Changes in environmental quality:		
Due natural processes		
Due to economic activity		

Stock Calculation Methods

1. The appropriation method
2. Resource rent derived from PIM calculations
3. Resource rent derived from capital service flow calculations

Multi-National Entities Operating in Nigeria and Environmental Accounting

In a study like this, it is not possible to appraise the activities of all the multi-national entities operating in Nigeria. Hence the investigation is restricted to entities operating in the oil sector (the main stay of the Nigeria economy. Within the oil industry the investigation is further narrowed down to Shell Petroleum Development Company of Nigeria (SPDC). The use of SPDC for the appraisal is adequate and appropriate because shell occupies 70 percent of the oil industry in Nigeria. Oil exploration impact negatively on the environment where drilling takes place. Some of the problems association with oil exploration are destruction of the aquatic life and farm land, water and air pollution and out weak of strange diseases. This explains why people of the Niger Delta who suffer from the harmful effect of the environmental pollution are agitating for resource control.

It should be noted that oil is an exhaustible asset. Every successful well has a life span. At the end of the life span, the entity that benefited from the asset is expected to restore the environment to its original state. Shell has been carrying out exploratory activities in the Niger: Delta since ages. Their effort at striking a successful well paid off in the 1950s. Most of the successful oil wells that were drilled in the 1950s and 1960s will soon dry up. Then, there will be the need to restore the environment back to its original state.

In order to avoid expenses associated with restoring the environmental Shell decided to sell off it's ageing oil wells to indigenous oil entities shell as Seplat Oil Drilling Company. By the time these ageing wells finally dry up, Shell will abdicate responsibility for restoring the environment. Ironically, the indigenous companies do not have the financial muscle to restore the environment. It is a capital intensive exercise. In the light of the above analysis, it could be argued that multi-national companies operating in Nigeria has failed to adopt environmental accounting system.

The question raised under value of stock level illustrate why Shell Petroleum Development Company (SPDC) is selling her ageing successful wells to indigenous oil exploration companies e.g. Seplat. The idea behind their action is to avoid the expenses associated with restoring the environment after many year of degradation.

CONCLUSION

Assets accounts and valuation of natural resources stock is concerned with recognising the role of environmental resources in the production of goods and services. Placing value on environmental resources ensure that a nation wealth's are not under estimated. In Nigeria this level is yet to be attained.

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