

NATURAL RESOURCE MANAGEMENT FRAMEWORK FOR SUSTAINABLE DEVELOPMENT IN NIGERIA

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ABSTRACT

Nigeria is a country in Sub-Sahara Africa endowed with a lot of natural resources in the form of oil, gas, coal, fossil, minerals and forests which are located in many parts of the country. Major portion of her foreign exchange is earned largely from oil exports (majorly oil). Many of these resources are essentially non-renewable and by excessively extracting these resources while paying little attention to its abundant renewable resources, it is most likely for the country to exhaust the resources of this nature in no time. Over the years, the sustainability aspect of the non-renewable nature of oil has been overlooked as reflected in policies designed to obtain short term gains while ignoring revenue generation capacities from other assets especially renewable resources. Sustainability in the control and prudent use of all forms of resources may be the focus of policymakers to ensure, to the degree possible, that present and future generations can attain a high degree of economic security while maintaining the integrity of the ecological systems upon which all life and production depends. The focus of most researchers has been on proffering solutions to the challenges posed to natural environment by the use of natural resources while paying little attention to the efficient use and the sustainable development in Nigeria. This paper therefore, adapted Lodhi and Makki (2010) Policy Matrix Framework for natural resource management and develops policies for gaining maximum economic benefits from these assets in Nigeria both in the short and long terms. The paper suggests that Nigeria should view natural resources as critical asset and design specific strategies for their development in such a manner as they do not work against one another paying special attention to their environmental implications.

Keywords: natural resources, renewable and non-renewable resources, sustainability, Policy Matrix Framework.

Introduction

The importance of natural resources to countries especially developing countries like Nigeria cannot be over emphasized. A number of countries depend largely on exports of their

natural resources, earning major portion of their foreign exchange from these exports. Natural resources have contributed not only in terms of income generation, social protection,

employment creation, infrastructure development and human capital development (health and education) but also through ecosystem goods and services in the form of food, raw materials, water and air purification, erosion prevention, biodiversity and cultural services. As argued by Onigbinde (2008), resources such as oil and diamonds are important commodities on the international market and for countries that possess large deposits of these resources, the wealth accrued from their production and exportation increases their national income thereby enable the implementation of different poverty-reduction policies and programmes which result in growth and development of many economies. However, in some developing countries resource endowment has been a curse, especially for the population and the region where these resources are extracted from due to poor resource management.

Nigeria is abundantly blessed with natural resources such as oil, iron ore, copper / nickel, coal, marble, gemstones, water, wildlife, soils, forests, veld products, and a whole lot of others. Over the years, the country has relied solely on oil as its major source of income, ignoring its non-renewable nature and paying little attention to other resources. Oil production and exports have hugely increased since commercial production in 1958. According to Nigeria National Petroleum Corporation (NNPC Report, 2017), as at January 2016, production of crude oil stands at 2.15 million barrels per day contributing more than 90% of export earnings and about 83% of Federal government revenue while reserves of crude oil stand at 28.2 billion barrels (Gbadebo, 2008 and Donwa et al, 2015). The huge revenue from oil provided opportunity for increased spending and investment. It also made the economy highly dependent on this resource.

Despite the major contribution of oil (non-renewable) to government revenue and foreign exchange earnings, renewable natural resource sector comprising agriculture, forestry and fisheries make up the largest single share of national output, income and employment. This sector accounts for not less than 21.2% of GDP as the last quarter of 2016 and is the major source of livelihood for the rural dwellers (Nigerian Gross Domestic Product Report Q4 2016). These renewable natural resources can be maintained, replenished, improved or degraded depending on its management and use. Other renewable energy which the country is blessed with includes but not limited to; hydro power, wind and solar energy. These other energy sources have only been used in small amount in the country. At present, solar energy is mainly used in urban areas for street lighting, while it is used in the rural area for irrigation and pumping of water. However, the country is targeting producing 7% of its energy need from renewable with solar and hydro as the major priority by 2025 (International Renewable Energy Agency Policy Brief, 2016).

In spite of the huge resources (renewable and non-renewable) Nigeria is endowed with, the economy still grapples with many problems including high and rising unemployment rate, declining manufacturing production, high and rising level of poverty and poor infrastructural development (Solow, 1999 and Akinlo, 2012). These problems can be attributed to the non-inclusive nature of growth being experienced over the years and the over concentration on oil sector while neglecting other natural resource sectors in the country. There is need therefore to develop Natural Resource Management (NRM) framework that will view natural resources as critical assets and design specific strategies for their development. This should be done in such a manner that they do not work against one another while paying special

attention to their environmental implications for sustainable growth and development (Lodhi and Makki, 2010; Barrera-Bassols et al., 2005).

The new planning process according to Bruyninckx, (2004) is an outcome of NRM which is a major tool used in exploring and improving the strategic planning of governments by the policy makers. Efforts of international bodies like United Nations has made possible the role of NRM in highlighting the threat posed to world food production by desertification and soil degradation (Lodhi and Makki, 2010). Such threats could also emanate from man's constant exploration of natural resources creating an environment for competition and conflict. In this context, when resources are scarce and the demand is high, conflict increases. Reconceptualising national security involves looking inside the borders of the country and finding out what factors continue to remain a threat to its peace and stability and that of the individual within its confines.

Natural resource management is closely tied to resource control. Resources when properly managed and locally controlled should bring economic development, reduce poverty and improve the economy of the country as a whole. Resource control largely deals with the need to regain ownership, control, use and management of resources primarily for the benefit of the communities and the people on whose land the resources originate and generally for the development of the entire country (Lodhi and Ahmad, 2008; Adelegan, 2009). Proper natural resource management also involves accountability on how these resources and the wealth are used. Oronto (2003) argued that proper resource management ensures that everyone in the country benefits from the resource wealth in a fair and equitable manner. Resource endowment would therefore be a blessing for the countries that possess them only if properly managed.

Poor resource management is a problem in many resource-rich developing countries including Nigeria. The argument that the more resources a country has the more prosperous does not hold true when one examines these countries and the regions where the resources are extracted in particular. For instance, mismanagement of resources coupled with the constant neglect of the Niger Delta region in Nigeria by the government has created a wide range of grievances and huge economic problems for this region and other areas where resources are being extracted. These problems include heightened poverty and gross underdevelopment in spite of the vast wealth brought in by oil (Onigbinde, 2008).

In Nigeria, over the years, resource management policies have been planned in isolation couple with the lack of political will for proper implementation. As argued by Lodhi and Munir (2007) weakness in policy development process in many resource rich developing countries is the major reason behind policy failures. The policy makers do not apply a comprehensive policy framework that brings about development but rather, focus on shallow strategic vision that cannot speed up development. Also, in most cases, government officials are corrupt and in other cases, multinational companies pay militant groups, payments which are disguised either as oil servicing or community development contracts or as customary payments to communities

The efficient use of Nigeria's natural resources, as advocated by many researchers for sustainable development is expedient at this juncture. Most studies in the area of natural resource management in Nigeria have focused on proffering solutions to the challenges posed to natural environment by the use of natural resources while paying little attention to the efficient use for sustainable development in Nigeria (Adelegan, 2009, Fatubarin, 2014) The major focus of this paper

therefore, is to provide the framework for efficient Natural Resource Management which will ensure that the financial benefits obtained from the use of natural resources is re-invested in the people for sustainable development in Nigeria. The rest of the paper is therefore organized as follows; section 2 discusses the need for natural resource management while section 3 presents the literature review and evolution of natural resource management system. In section 4, emerging frameworks for measuring national assets was presented. Section 5 discusses Natural Resource Management Framework while section 6 concludes the paper.

2. Why Efficient Natural Resource Management is Essential

The natural resources management is concerned with the sustainable management of the Earth's depleting natural resources such as clean water, energy, minerals, and biological resources with a particular focus on how their usage affect the quality of life for both present and future generations (Akpan, 2005). In other words, natural resource management deals with managing the way in which people and natural environment interact. It brings together land use planning, water management, biodiversity conservation, and the future sustainability of industries like agriculture, mining, tourism, fisheries and forestry. It recognises that people and their livelihoods rely on the health and productivity of our landscapes, and their actions as stewards of the land play a critical role in maintaining this health and productivity.

A system for sustainable natural resources management was first started by US in 1942 with the purpose of providing information to the policy makers for better resource management (Allen, 2007). The first step towards efficient management of natural resources under this approach is to properly account for all natural assets in a nation. It is

through keeping accounts of natural assets that managers would be able to ensure its sustainability. Second, accounting for depreciation will indicate that unless the capital stock is maintained or replaced, the future consumption possibilities are bound to decrease. However, keeping an account of natural assets can be extremely difficult, mainly due to the variety of assets.

For instance, considering the wood in a forest, it is evident that different tree species have different economic value. Similarly, the mineral ores present in a region may have different economic value compare to other regions in terms of the grade of the ore and its extractive costs. This definitely may not be an easy task and even if separate accounting books are to be maintained, the cost of data collection and maintenance of such books will be huge. Besides this difficulty, it may be extremely challenging to determine the economic value of each natural asset present in a country. The accountants would like to report each asset in monetary terms as long as possible, but all assets cannot be converted into money value. As a way out of this difficulty the present accounting system could be enhanced to capture different categories of national assets and include newer heads of accounts that will capture those assets that may not necessarily be giving monetary value.

Another approach for efficient resource management was propagated by the World Conservation Strategy (IUCN, 1980) in 1980. The approach promoted the concept of sustainability by stating that sustainable utilization of resources should be viewed as being similar to spending the interest of money kept in a bank while keeping the original capital saved, meaning that for utilization of natural resources to be sustainable, policy makers should ensure that the indefinite coming generations should benefit from the stock of resources. Following this line of argument, Daly (1990) provides

two basic principles for the management of resources especially for renewable resources. First for coming generations to benefit from resource stock the rates of harvest of natural resources should be equal or lower than the rate of regeneration to maintain sustainability. Second, and in showing concern for the environment, the explorative and extractive activities should be such that the waste emission rate is lower or at the most equal to the natural assimilative capacities of the ecosystem under consideration. He states further that regenerative and assimilative capacities should be considered as natural capital, meaning that a failure to maintain these capacities must be considered as capital consumption thereby making the system unsustainable.

Many countries are suffering from the 'resource curse' because they have been focusing on gaining monetary maximum benefits from the natural resources, while ignoring the nature of the resources, the sustainability of the exploration and extraction, and the long term consequences of their actions on the environment. By focusing on non-renewable resources and economic gains alone, a country could easily exhaust its mineral resources, or cut down its forests and as a result, lose its fertile soil. It is therefore pertinent to focus on discovery, development and determine maximum sustainable yield of renewable resources which are eco-friendly. For instance, Nigeria economy, though formally built on agriculture, has over the years being built on oil extraction and crude oil exportation which has a limited life span while paying little attention to other renewable resources

The present regime of natural resource management in most resource-dependent countries like Nigeria is 'state-centric' to the extent that they depict (over) centralized resource governance structure. Some have argued that the present over-centralized

regime of resource management in many resource-dependent countries in Africa often lead to resort to 'self-help' by the locals. This is usually by way of illegal siphoning of oil otherwise called bunkering, illegal logging, and mining as well as acts of sabotage like vandalization of oil pipelines and related acts of economic sabotage and violence like kidnapping of expatriates. Akpan (2005) summed it up that "Conflicts over control of natural resources and the wealth generated by it have assumed alarming proportions in Nigeria. Hardly a week passes by without reports of host communities taking over oil installations, kidnapping oil workers for ransom or sabotaging oil pipelines. There are also dramatic scenes of women taking over installations of oil companies in the struggle for resource control. The problem has led to the withdrawal of resource exploration and exploitation companies from some host communities, while in others, exploitation activities take place only under the watchful eyes of soldiers providing security"

While many observers have shown concern that Nigerian governments are following a path of destruction by consuming irreplaceable resources and resultantly, creating adverse side-effects in the system, there are those who believe that with the advent of technology, substitutes would be provided for us, and that there is really no need to worry (Craig and Glasser, 1994). However, it is agreed that, in order to address sustainability of natural resource system, new management paradigm should be such that the usage of these assets are treated as capital consumption while the income and revenue generated should be invested in other assets that could be developed to replace the dwindling non-renewable assets (Repetto, 1994).

3. Literature Review and Evolution of Resource Management System.

Natural resource management specifically focuses on a scientific and technical

understanding of resources and ecology and the life-supporting capacity of those resources. Environmental management is also similar to natural resource management. In academic contexts, the sociology of natural resources is closely related to, but distinct from, natural resource management.

Sustainable resource management system can be traced back to early attempts to understand the ecological nature of North American rangelands in the late 19th century, and the resource conservation movement of the same period. The analysis coalesced in the 20th century with recognition that preservationist conservation strategies had not been effective in halting the decline of natural resources. Over the years a number of other frameworks have been developed by decision makers. Performance management systems is an umbrella term used for these frameworks. The term 'performance' has been defined as a metric used to quantify the efficiency and / or effectiveness of an action, while 'measurement' is the process of quantifying (Neely, Gregory and Platts, 1995). The idea behind this framework is the marketing perspective that organizations achieve goals, when they are able to satisfy customers with greater effectiveness than their competitors (Kotler, 1984).

However, Johnson and Kaplan (1987) and Bruns (1998) highlighted many deficiencies in the performance system. According to them, the overriding goal for profit organizations is to maximize profit without given attention to the externalities as result of their activities. The new paradigm requires that the management measures of performance should reflect the environmental impact of organization's activities. In order words, focusing on cost/benefit measurement systems only provides a historical view while future performance of the system was giving little or consideration. Other "First Generation of Balanced Measurement Systems" of

resource management that were developed after performance measurement system which may be considered as comprehensive measurement frameworks were 'Balance Score Card' by Kaplan/Norton (1996), the 'Performance Prism' by Neely, Adams and Kennerley (2002) and the 'Skandia's Navigator' by Edvinsson/ Marlone (1997). These systems opined that the financial biased measurement systems should be supplemented with non-financial indicators. However, the problem with this was their static nature as they failed to illustrate the linkages between different performance measures.

The second generation of management systems which include "Strategy Maps" by Kaplan and Norton (2000), Success and Risk Maps by Neely, Bernard, Roos, Pike and Gupta (2003), and the IC-Navigator Model by Pike and Roos (2001) were developed to address the inherent deficiencies associated with the previous system. The system emphasizes on the dynamics of value creation by monitoring transformation of resources as well as the available stocks of the resources. The Third generation of management system was Intangible Asset Monitor, (IAM). This system measures national assets in a comprehensive manner (Malhotra, 2003). IAM framework gives planners an advantage of not only recording the asset, but at the same time also viewing their utilization, minimizing risks and sustainability of the assets. The main agenda of the model is "Linking Financial to non-Financial and intangible dimensions of an organization". The fundamental objective of this management system is to develop a system for demonstrating cash flow implications of non-financial and intangible organizational drivers. In a more recent time, and specifically in 2005, the government of New South Wales established and implemented a standard for quality natural resource management based on an adaptive management approach to improve the

consistency of practice. This approach recognises the intertwined social, cultural, economic and political aspects of resource management (Thakadu, 2005).

In Africa, a regime of economic-motivated colonization was entrenched in the region through imperialists' legal and socio-political governance structures. The Western idea of resource ownership and management was conceived, developed and introduced. Colonization relegated indigenous cultures and the natural world in which the local people had lived to the status of commodities that could be taken and owned by non-indigenous colonizers. This was reflected in the name given to each colony. Countries were defined in terms of natural resources and other economic goods found in each region: the Ivory Coast which was later renamed Cote D'Ivoire, the Gold Coast later renamed Ghana, and the Slave Coast (Liberia).

The name 'Nigeria' emerged from River Niger - a marine environment rich in natural (aquatic and aquaculture) resources. The river served as the commercial route for the British companies through which natural endowments were plundered (Oke, 2004). Unlike the British colonizers and their 'mercantilists' cronies, who viewed resources in terms of property goods for purposes of extracting economic benefits for the individual owners, the traditional communities view their natural heritage or resources in collective terms, even where resources are vested in individual managers, they are responsible to the larger community and future generations of community-owners. The traditional resource management patterns in Nigeria were undermined, and many of them became structurally deformed, derailed and disintegrative. The dysfunctional impacts of these were not immediately felt until few decades after the colonialists had gone. A World Bank (2003) study on Nigeria corroborates this assertion. The report

succinctly points out the extent of degradation brought about by colonial incidents vis-à-vis traditional systems and indigenous institutions of resource and environmental management in the country.

4. The New Paradigm for Measuring National Assets

The frameworks for managing natural resources discussed above have been discussed extensively and modified by researchers and adapted for use at national level in many resource rich countries. For instance, The Skandia Navigator (Edvinsson and Malone, 1997) was one of such frameworks used by some researchers for measuring and developing national policy initiatives. This and many other frameworks were later modified and converted into excellent management tools for development and implementation of strategic plans; focusing on measurement and management, innovation and learning, customer relations, value creation and process improvement (Bontis, 2002, Malhotra, 2003).

Besides, Lodhi and Ahmad (2008) gave an overview of New National Wealth which include physical (natural resources) and non-physical (human resources–Intellectual Capital and Knowledge Assets) It is pertinent to note that human knowledge is non-physical, non-appropriable, not measurable directly, incompatible with conventional standards unlike natural resources. The total assets of a country now entails comprehensive account of nation's wealth (tangible and intangible) which include new assets (besides the conventional assets like forests, mineral resources, oil, factories, roads network, communication infrastructure, agricultural and other material products) like quality of life, life expectation, education level, tourism attractiveness, management quality, use of information and communication technologies, research and development spending and ratio

of young to old population (Bontis, 2004; Lodhi and Ahmad, 2008). Therefore, the overall wealth of a nation depends on how efficiently and intelligently these assets are been used.

Based on the above frameworks and as advocated by various scholars, natural resources of a country are potential assets from which an endowed country may obtain financial benefits. However, for these assets to be beneficial to the people, such derived benefits must be reinvested in the people in the form of educational programs, health care and development of infrastructure. This would in turn directly add to a nation's wealth. Therefore, in general, the overall wealth of a nation depends on how intelligently and efficiently a nation's assets are utilized.

5. Natural Resource Management (NRM) Framework

Efficient framework for managing natural resources of a country can be derived, and by extension from the analogy of management frameworks designed for efficient management of business organizations. This paper adopts a matrix framework, called "The Intangible Assets Monitor" which is a nonfinancial measurement system as used by Ladhi and Makki (2010) because it ensures and monitors renewal, efficiency and stability. Also, this indicator can be incorporated into a management information system. The framework can facilitate development as well as implementation of a natural resource management policy, it also facilitates for viewing policy as a live document. Policy makers of resource rich countries like Nigeria can amend their policies or give new directives in the light of the updated indicators of the framework.

Figure 5.1 depicts the framework designed for four segments of natural resource management in Nigeria. Firstly, it records the status of all categorized natural assets that is present in Nigeria in appropriate unit. This

measurement can be in any appropriate quantifying unit for the asset being accounted and not necessarily in Naira or Dollar value unit. Quantity of specific asset that is being exploited is recorded, giving the pictorial view of the total stocks of resource. Details of the use of the asset is also given, which gives a flow picture of the asset. The numerical figures used in the Policy Matrix Framework for total land area, forest area, agricultural and arable land are for 2015 (Trading Economics, 2017).

The second part of the segment in the framework is basically futuristic. That is, it as claim to future benefits without physical or financial embodiment. A review of this section will give policy makers knowledge about how efficiently the country is utilizing its marketed natural resources, and monitor the risks to the natural resources. This section will also ensure that poverty and social exclusion is wiped out through the sustainability of the natural resources. In the third framework, the policy initiative is that natural resource plan are placed parallel to the proposed national development plan. The fourth part of the framework provides information to policy makers on the progress and effectiveness of their policies. To implement the framework, indicators are developed for measuring each policy perspective.

Generally, three to four indicators may be needed for each policy perspective. The indicators developed must be measurable, so that a comparison can be made in future for determining performance against each indicator. The figure (1) shows imaginary values for assessing forests as natural asset in a country. Firstly, forest is recorded as natural asset in the column reading Natural Assets. The second column shows the total forest area in the country, showing the availability of this particular asset, followed by the utilization figure, by giving the amount of the asset underutilization.

Figure 5.1: Policy Matrix Framework for Natural Resource Management (NRM) in Nigeria, 2017. (Based on IAM Sveiby, 1997 and Lodhi & Ahmad, 2008)

	National Accounts for Natural Assets		Progress Monitoring	
	Account #. <u>Nigeria</u> Name asset: Agriculture; Petroleum/Gas; Coal; Bitumen; Iron Ore; Gold.	Policy Initiatives NRM	Targets Dec., 2017	Progress July, 2017
Available Assets	–Agricultural Land – 76,200,000 hectares (77.74% of Land Area). –Petroleum/Gas –35 to 40 Billion Barrels of Crude Oil/Estimated 176 Trillion cubic feet of Gas. –Indicated Coal reserves of about 3 billion metric tonnes and 600 million metric tonnes of proven reserve of coal –Bitumen/Asphalt/Tar Sand reserve stands above 58 Billion Barrels. –Iron Ore has a total reserve of over 120 Million tonnes. –Gold no known reserve till date.	<i>Guideline from National Development Plan</i> • Increased in area under forest • Increased in cultivation area • Increase in geographical exploration across the country.	15% increase	12%
Utilization	–Arable Land managed – 34,000,000 hectares (37.33% of Land Area) Forest Area managed – 6,994,713.60 hectares (7.68%) of Land Area –Oil production capacity of 2.5 to 3 mbpd/About 5.5 billion cubic feet of Gas is produced per day out of which 2.5 billion if flared representing 40% –Coal is found in 13 state in Nigeria with 0 production. –Bitumen is still being imported into Nigeria as of today.	<i>Guideline from National Development Plan</i> • Increase in wooden furniture exports • Increase in cereal yield (kg per hectare) exports • Increase in production capacity relative to the reserve deposit of fossil fuel. • Installations of new equipment for exploration and production of refined fossil products. • Increase export of refined fossil fuel and zero importation of the mineral resources present in Nigeria.	7%	6%

		–Iron Ore is still majorly imported into the country –Gold production is about 170 grammes per year.			
Policy Perspectives	Utilization Efficiency	• Cost per unit. • Reinvestment for risk minimization and sustainability /Revenue earned	• Increase in Utilization efficiency	60%	60%
	Risk Minimization	• Water available for irrigation and forest development • Availability of modern survey and production equipment to avoid wastage of fossil fuel extraction.	• Develop and increase the Water resources • Develop and increase survey and production equipment.	11%	9 %
	Sustainability	• Limits of the land that must be left to fallow and the ratio that must be cultivated • Limits of the forest area that must be kept as national reserve • Ratio of new trees planted to trees cut • Ratio of fossil fuel extraction to national reserve	• Improvement in sustainability ratio	5%	5%

From the first column in figure 5.1 downward, the assets under consideration are recorded as indicators under policy perspective. The first policy perspective is “Utilization efficiency indicators”. It is usually normal to come up with at least three to four indicators for each perspective. Second policy perspective to Utilisation efficiency is “Risk minimization”, which has to do with reducing the risk of resource depletion. In case of forest area and arable land, availability of water can be a good indicator for monitoring risk for the asset. Column three shows indicators for the “sustainability” perspective. The purpose of the column is to ensure that the policy makers are continuously observing the sustainability of the asset. The indicators developed for this section could be the ratio of the arable land that must be cultivated to the land that must be left to fallow and the rate at which the trees are being cut to the number of new trees planted.

The National Development Plan of the Nigeria must reflect her Natural Resource Management policy. The Policy initiatives column in the framework will be of great help here. The first box of the Policy Initiative column shows the policy directive from the National Development Plan regarding the particular natural asset. The National Policy directives for both, available asset as well as its utilization are recorded. The second box gives the policy directive regarding the ‘utilization’ of the same asset as directed by the National Development Plan. National directives on agriculture could be to increase the forest area, increase arable land available for cultivation, increase wooden furniture exports and the directives may be to increase the cereal yield exports. In the area of fossil fuel management, directives could be to increase the scope of geographical exploration to discover more deposit of fossil fuel resources such as crude oil thereby increasing

daily production to meet up with the OPEC quota and beef up reserves.

The next columns are the actual directives for the Natural Resource Management Plan. These directives must go hand in hand with the directives of the National Development Plan. The policy initiative column corresponding to the utilization efficiency row contains the policy directives on utilization of natural assets under NRM plan and in the light of NDP.

The one that follows after the above, under the same column contains policy directives for “Risk minimization” for the NRM policy. The NRM policy directives could be to develop and increase the water resources or to develop survey plans and production equipment. This directive should be designed to help implementing the NDP rather than conflicting with other directive of the Plan. Finally, the last row contains NRM directives for ensuring “sustainability” of the asset. General NRM directives in this case could be to improve sustainability ratio. Again, the NRM directive should complement the implementation of NDP and not opposing the plan.

Implementation and proper monitoring are the integral part of the success of the policy as it is very easy for a policy to lose focus and become redundant if its progress is not monitored continuously. The general practice is that a monitoring and evaluation framework is developed separately for the purpose. The framework provides performance management indicators in the same tool for better integration. However, there could be lack of alignment if the policy development and monitoring framework is developed by different teams which will greatly hamper the success of the approach. The last two columns of the framework provide performance monitoring mechanism. The columns give targets and reports progress

on each target against the policy directives. It is best that the targets are developed in a quantitative format, nevertheless, the choice of the format would depend on the type of asset being monitored.

Estimates of the asset life must be based on the available physical stock and on assumed rates of extraction. It is therefore necessary to conduct progress reviews the data presented in the columns. The columns need to be updated periodically especially every six-month cycle for conducting regular reviews.

The costs of poor management of natural resources management, if not properly addressed, can be enormous on less developed countries and the poor, who are more likely to depend directly upon resources for their livelihoods. Poor resource management includes failing to manage resources on a sustainable basis as in the case of the framework above, failure to properly invest the revenue from the sale of natural resources, and the failure to collect proper rents from resource concessions, thereby allowing most of the gain from resources to go to private actors at the expense of the public. As a rule, poor natural resource management represents lost opportunities for sustainable economic development, and costs to human beings and the environment. It is therefore important to include the participation of the local population because issues of NRM are highly linked to the socio-economic environment of the people living in an area. This can be achieved by forming local committees and educating these committees on the issues.

An active adaptive approach should be employed such that the framework developed above are followed and cascaded for maintaining records at federal, regional, state and local levels so as to ensure better policy

monitoring and implementation successes at all levels.

6. Conclusion

Most of the developing countries still follow obsolete procedures in their planning and management of Natural resource management and as a result suffer 'resource curse'. Poor decision-making that values higher but unsustainable current growth rate over long-term economic development often results into the lost opportunity. In the contemporary world, it is imperative for policy-makers to adapt some basic principles in managing the country's natural resources. Some of these principles include; designating natural resource policies and management actions which are tested as experiments; monitoring the effects of policies and management actions through indicators; modifying policies and management actions on regular cycles, or mid-course when possible; and synthesizing knowledge of outcomes gained through management cycles (including organizational, social, as well as ecological and economic knowledge) with stakeholders and incorporating this knowledge into the next planning and policy-making process and decisions.

The paper therefore, presents a framework that can be converted into a management tool for Natural Resource Management in Nigeria. The framework serves as an active adaptive tool where indicators are developed to allow for proper management and prudent use of national assets. The policy makers can use the tool for performing three basic management tasks of recording natural assets, developing natural resource management policy in the light of national development plan and lastly, use the framework for natural resource management policy monitoring.

It is recognised that managing multiple resources simultaneously will increase the complexity of natural resources management framework and general indicators as compared to a single commodity management, it is recommended that Policy makers should start viewing the environment as an eco-system, in which each natural resource has a specific part to play and the very existence of human beings is dependent on the continuity of this eco-system. Certainly, Natural resources are indeed a gift of nature

and should be viewed as assets of a country which should be managed rather than spent. Adoption of the framework for managing natural assets in the paper would be a useful tool in developing policies that meet international standards for sustainable resource management which is capable of addressing emerging challenges, like erosion, flooding, soil degradation, oil exploration and oil spills, deforestation, management of agriculture land produce and water shortages in Nigeria.

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