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Green Economy: The Role of Estate Surveyors and Valuer

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Abstract. The continuous existence of man is dependent on the free goods and services (e.g. water, air purification, fisheries, timber production and nutrient cycling) provided by his natural environment. Due to the public nature of these goods and services, they are not traded in the open markets hence, they are regarded as not having market prices. As a result, the current economic system fails to capture their losses and this may continue for long if care is not taken. Unless economic decisions (and the associated implications of development options) are made based on valuing the invisible aspects of ecosystems, unfriendly environmental decisions may continue to be taken that will culminate into economic, social and environmental cost which may be unmanageable. It is therefore expedient that a Green Economy with consideration for the immense value of biodiversity and ecosystems be incorporated by both corporate and governmental agencies so as to ensure a sustainable development progression in an economy. In achieving sustainable green economy, the appropriate stakeholders should pay particular attention to the value of natural capital in any policy decision. Hence, this study examined the roles of Estate Surveyors and Valuers (ESVs) in a green economy. Exploratory approach was employed in carrying out the study. Literature review technique was adopted to examine the various aspects of the economy and the roles of ESVs that help in greening the economy. The study identify the roles of ESVs in greening an economy to include: ensuring the use of renewable energy instead of fossil fuel in their management properties, adoption of efficient technology that consumes less energy, advising on waste minimization and appropriate waste management approaches, giving consideration to ecosystem services while carrying out development valuation and finally promoting decent jobs that takes cognisance of employee's welfare, job security and career prospects. The study therefore recommends that the time has come for Estate Surveyors and Valuers to be actively involved in greening Nigerian economy.

Keywords: Green Economy, Nigeria, Estate Surveyor and Valuer, Ecosystems, Public Goods

1. Introduction

Natural capital constitutes the foundation for man's total well-being and is an important asset for economic prosperity. Nature provides a range of goods and services whose economic value has thus far been invisible and therefore constituting a major reason for their undervaluation and mismanagement. Words like 'natural capital accounting', 'financialization of nature', 'ecosystem services' and 'biodiversity offsets' are used to explain 'Green Economy'. The root of green economy is in the development and use of goods and services whose focus is to protect the environmental and at the same time ensure energy security. It could also be seen as an economy that consists of industries and businesses engaging the provision of efficient energy, prevention and reduction pollution, renewable



energy and mitigating or cleaning up pollution.

The concept of green economy (GE) is not a new one, it was first adopted in a publication by [1] titled *Blueprint for a Sustainable Economy* submitted to London Environmental Economics Centre (LEEC). At the inception, the concept was not widely accepted. The financial crises experienced in 2007, by most countries and their failure to buy into the sustainable development goals showed clearly the need for change in development paradigm that will yield the desired outcomes on economic, social or environmental fronts, the tripod on which sustainable development stands. The crisis in the global financial circle greatly diminished the liveliness of strong economies [2] and [3]. Their expenditure and production were constrained in response to rapid manifestation that further resulted in the reduction of both international and national Gross Domestic Product (GDP) that was witnessed in different countries, where only very few countries, such as the Asian Tigers, being spared [2]. According to [3], this crisis hampered their abilities to structure other complex and intertwined crises facing them. They all directed their efforts to transit into a sustainable development route and in other to accomplish the objectives of Agenda 21 moderately. A number of factors had actually been identified as constraints to this transition.

According to [4] the existing of economic growth did not take adequate cognizance of the environmental aspects of the crises faced by the countries. Also, [5] asserts that the disappointment emanating from sustainable development efforts coupled with the persistent crisis over the last decades, have given room for the adoption of new paradigms for economic growth. Brand [6] was of the view that such changes should not focus only on bridging the gaps between achieving environmental sustainability; it should equally look at compensation for environmental degradation worldwide.

Failure to bring out genuine reason(s) for investing in the environment has been identified as one of the factors militating against the progress in sustainable development. In order to encourage investors (policy and decision makers) to make meaningful investment in the environment, there is a need for them to be persuaded that investing in the environment will produce economic gains for them as well. Such gains could be in the form of increased output, generation of more jobs, positive impact on GDP, creation of new market alcoves and increased trade. Oni, Ajibola, Iroham, and Akinjare [7] stated that an average investor desires high positive net returns. This is also true about greening an economy. To convince an investor to invest in environmental resources will require that such an investor is convinced of sustainable income from such investment. This has therefore called for the establishment of a distinct relationship among their investment in the socioeconomic, environment and sustainable development. Having identified human welfare as the utmost ambition for any development blueprint therefore, there should be a well designed sustainable improvement approach with the intention to culminate in the eradication of poverty. In the light of this, GE could be seen as a way to emphasize these linkages. Hence, GE could then be assumed to be a facilitating tool or vehicle for transiting to sustainable development.

This acknowledged failure, as identified above, brought about the existence of disciplines such as that of green economics. Early studies in green economics identified past underestimation of natural resources and ecosystems in markets as the root of worldwide environmental crisis resulting as hindrance to the prospects of long lasting economic progress [8], [9], [1]. In their report, [1] stated that there is the necessity to correct such over-sight in a new economic model so as to make urgent policy progress towards the valuation and accounting for natural resources and the creation of incentives that would engender their use by economic actors in an environmental friendly way. This advice has remained the inspiring force behind the approach adopted by the Global Green New Deal's (GGND) foundations for transitions to greener economies [10], [11]. This has also constituted the fulcrum for the UNEP Report. The proposal by GGND placed emphasis on intensive investment in effective green technologies that place little demand on natural goods and services employed for their use [10], [11]. The final result was consequently the emergence of market-associated feats in support of the emergence of national

environmental accounts, carbon markets, and payments for ecosystem services schemes or investment in sustainable energy, agriculture and water technology, which culminate in the growing imperative for the adoption of better environmental management practices.

The result therefore, is the foundation laid for a contemporary and comprehensive proposal and report for a Green Economy prepared by [12] and titled “Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication”. The central focus of the report was on the belief that to achieve the main goal of sustainable development is completely on “getting the economy right” [12]. With the unpalatable consequences of undervaluation of natural resources in the earlier development paradigms, the Estate Surveyors and Valuers’ roles should be asserted if GE paradigm is to survive. This therefore calls for the examination of the roles that the Estate Surveyors and Valuers should play, in not just making the economy a sustainable one, but one that considers the effects of economic activities on the natural resources. Therefore, this study was set to identify the various roles of Estate Surveyors and Valuers in achieving a green economy in Nigeria.

2. Concept of Green Economy (GE)

Antonio [13] was of the opinion that green economy is a concept that has gained global popularity because it enhances economic growth, housing and food supply without jeopardizing the environment. It additionally advocates and promotes a system that proactively addresses and prevents economic and environmental disaster as against the system that allows. According to [14] a Green Economy is one that would “result in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities”. Considered in a simpler form, GE is one that is “low-carbon, resource efficient and socially inclusive”. In the earlier stage, the similarities of GE to sustainable development resulted in some form of confusion and thought about whether sustainable development was being replaced by GE. This has however been cleared by United Nations Conference on Sustainable Development [15] clarification on the matter which has since been articulated and requirement to refer to “the Green Economy in the context of sustainable development and poverty eradication”.

The definition given by UNEP is a clear indication of total commitment to both the social aspect of sustainable development as well as fighting climate change the will result in low carbon dependence. This will culminate in integrating areas of focus that is outside the traditional economic sphere. In the opinion of [16], UNEP presented an acceptable definition of a green economy by defining it as a system of economic activities hinged on the how the goods and services produced, distributed and consumed helped in improving the human welfare for a long period of time while not subjecting unborn generations to expressive vagaries of environmental risks and ecological scarcities. The author was of the view that the GE concept carries with it an economic growth that protects the earth’s ecosystems and can equally help in reducing poverty to a bearable level. Other definitions of GE given by other contributors include that of the Green Economy Coalition [17] which states that a Green Economy should “generate a better quality of life for all within the ecological limits of the planet”. Also, International Chamber of Commerce [18] is of the view that the relationship between economic growth and environmental stewardship is a mutual one that will reinforce and at the same time engender responsible supports for social development. On the other hand, the Danish 92 Group defines GE as a dynamic and evolving process of transformation that “cannot be Green without being Equitable” [19].

Comparing the definitions of sustainable development and GE, [20] was of the opinion that just like that of sustainable development, the definition of Green Economy is vague and incoherent since it assumed that there is no cause for trade-off between environmental health and economic growth [6]. Other researchers such as [21] and [22] completely disown it and its foundations. Hence, these had made it difficult to clearly identify a Green Economy and garner international, national or local for its support.

Table 1: **Main Elements of Green Economy**

| Elements | Focus |
|--|--|
| Generation and use of renewable energy | Focus should be the source of usable and renewable energy which could be used to in place fossil fuel sources since it will curb the undesired outcomes of greenhouse gas emissions and other pollution derivable from fossil fuel combustion |
| Energy efficiency | This harners on the adoption of approaches that are more technology efficient and consumes less energy yet provides the same level of energy service |
| Waste minimization and management | Attention is on the use of various processes to prevent, minimise, reduce, reuse, recycle, convert and dispose wastes. This will confine the use of materials and waste generation within the regenerative and absorptive capacities of the Planet |
| Preservation and sustainable use of existing natural resources | It places consideration on the importance and economic value of natural sources like freshwaters, forests, soils, coral reefs and ecosystem services supplied via active and flourishing ecosystems |
| Green job creation | Green job creation advances virtuous jobs that provide sufficient wages, secure working situations, job security, reasonable career prospects and employees' rights |

Source: Adapted from FAO [23]

According to the report submitted by Natural Resources Management and Environment Department of Food and Agriculture Organization [23] of the United Nations, the five elements of change as contained in Table 1 could be implemented in all the various economic sectors such as primary, secondary or tertiary. The primary sector focuses on transforming natural sources into primary products such as agriculture, forestry, fishing, and mining and quarrying industries; the focal point of the secondary sector is on transforming the output of the primary sector into completed goods and finally, the focus of the tertiary sector is the provision of information and services. Those three sectors place emphasis on establishing closed or semi-closed nutrient and energy cycles so as to minimize waste and at the same time boost recycling.

Fareed [16] identified some concepts of green economy as provided by UNEP [14] to include:

Table 2: **Concepts of Green Economy**

| S/No | Concept | Definition |
|------|--|--|
| i | Low Carbon Economy | It sees green economy as a function of the aggregate of the generation of carbon the totality of an economic activities within an economic system |
| ii | Green Growth (growth in a green economic system) | This is the extent the GDP increase this is measured by using concentrate on green sectors as new boom engines. |
| iii | Green Jobs | This concept defines green economy in respect of the existence of jobs within the green sectors of the economic system. It is equally referred to as green collar jobs |
| iv | Circular Economy | This is also known as round economic system and it focused how waste could be reduced within an economic system by way of converting the waste from one process, inside an organisation, to raw material/new input into same or a one of a kind within the same system |

Looking at items two and three, it shows that different sectors of the economy can be greened thereby creating opportunities for green growth and green jobs. In respect real estate profession, the concept of green economy takes cognisance of eco-friendly and sustainable construction and consumption of buildings to ensure slightest environmental damage.

3. Green Economy and Sustainable Development

In analysing the principles of sustainable development and green economy, [24] opined that both of them focused on the same goal. He similarly stated that sustainable development could now not handiest contain ecological practices that help in satisfying the needs of future generations, however could improve the production and patterns of consumption equitably such that the resources which might be currently being wasted are preserved and rechanneled so that the needs of both the present and future generations are adequately met. In the same vein, [25] concluded that green economy is a vision that focused on growth and development. It is one that can generate growth and improvement in people's lives in ways that are in consonance with sustainable development. In a green economy, income growth and employment is driven by means of both public and private investments that degrade carbon emissions and pollutants, upgrade energy and resource efficiency, and prevent destruction of biodiversity and ecosystem goods and services. These investments need to be inspired and supported by using targeted public expenditure, policy reforms and changes in regulations. This development pathway should preserve, enhance and rebuild natural capital especially economic asset and source of public blessings for poor whose subsistence and security totally depend on the natural environment.

What does this mean in relation to developing countries like Nigeria? Developing countries are particularly depending on natural resources. Natural capital assets are as a consequence essential to the economic activities and the livelihood of millions of people whose livelihood depend on fertile soil, woodland, fishery and natural resources. The exploitation of those resources has fostered high rate of economic boom, which in current years have been part of the strongest within the international world. However such economic overall performance, African nations and Nigeria specifically, are still grappling with continual poverty and unemployment as well as underemployment.

At the same time, the ability for future economic growth and development itself is being threatened by environmental degradation, climate change, desertification, and other environmental dangers and

resource scarcities that are propelled by both internal and external factors. The natural capital that constitute the platform for wealth introduction is fraught with mounting tension even when African countries are suppose to meet the rapidly growing demands for water, food and health, as well as reducing poverty and stimulating economic activity to create employment opportunities and increase income levels.

4. Valuation of Natural Resources

Writing a report on “who should cost nature” [26] identifies the stakeholders at the vanguard of valuing natural capital in developing countries to be majorly expert bodies such as academics, non-governmental organisations (NGOs) and consultancy firms. This assertion could be expected due to the simple reason that a few of these stakeholders have, for several decades, been agitating for the valuation of natural capital. World Bank, at the inter-governmental level, has been coordinating the Wealth Accounting and the Valuation of Ecosystem Services (WAVES) partnership since 2010 for the purpose of valuing natural resources. A cursory assessment of these initiatives suggests that the focus is usually on monetary valuation. In the guide to Corporate Ecosystem Valuation by the World Business Council for Sustainable Development (WBCSD’s) it was observed that there are qualitative, quantitative and monetary approaches to value and also noting that it is not always possible to convert all ecosystem value to monetary measure. It was stated in the guide that monetary valuation provides an important means of totaling, comparing and communicating the values of different ecosystem services. In practice the actors who are already valuing nature usually take cognizance of the economic values so as to make a strong case for business. They commonly spotlight the trade-offs of government economic policy that deals with areas like infrastructure thinking that the best way to do this is using monetary standards. It is at this juncture, that the Estate Surveyors and Valuers come handy to ascribing not just monetary values but values for those aspects of ecosystems that are not traded in the market.

According to [27], real estate practice is a profession that encompasses distinguishable range of services such as estate agency, property management, property appraisal/valuation, property development/project management, estate consultancy, compulsory acquisition matters and land economy. On the other hand, [28] noted that the real estate industry engages in the creation, management, and demolition of residence and business facility of the nation (these include, commercial, residential, industrial and agricultural properties); as well as the management of undeveloped land. Also, [29] stated that generally, man clamours for the provision of clean and decent environment. To get this will required the incorporation of green practices in the real estate practice as this will ensure that the cost of the environment is taking cognizance of in any decision making process.

Numerous projects in developing countries had shown that the actors that are commonly involved in compensation processes are governments and professional bodies such as academic institutions, conservation NGOs and consultancy firms. In situations where the communities living in an area where compensation for environmental sustainability scheme is to be paid, they are mostly involved in the implementation stage of the project but are usually ignored when it comes to deciding on the quantum of compensation to be paid.

However in Nigeria, the Estate Surveyors and Valuers are the only ones recognised by law to manage and carry out valuation of land resources and buildings. The Estate Surveyors and Valuers function in diverse sectors of the economy, which if properly harnessed and coordinated, will help in greening the Nigerian economy. The various functions of Estate Surveyors and Valuers, as harmonised in law include, but not limited to: maintenance of public infrastructures/assets, acting as land economists in respect of infrastructural development schemes, guardian of land and landed properties, arbitrators in case of land dispute, professional consultant on property matters, acting as educational instructors and employers of labour. These require that the ESVs should engage more in services that generate more jobs, increased output in their services, create new market niches and increased trade for the profession that create

positive impacts on GDP.

5. Uses of Environmental Valuation in Green Economy

Ogunba [30] identifies nine (9) uses to which environmental valuations can be put that will help in greening Nigerian economy. These uses therefore include inter alia:

- i. Promotion of sustainable development
- ii. Environmental valuation provides a means of justifying and setting priorities for policies, programmes, or actions that serve to protect or restore ecosystem goods and services.
- iii. Environmental valuation allows for the full pricing of resources through the consideration of both market and non-market values.
- iv. Environmental valuation helps in pricing pollution and degradation of natural resources so as to facilitate full cost recovery by concerned agencies.
- v. It is used in developed countries by governments (in urban/regional planning) for assessing whether to zone and invest in specified areas for development or to invest in the environmental conservation/protection of such areas.
- vi. Environmental valuation is as well used in several countries (such as Canada, Australia etc) for 'greening' national balance sheets.
- vii. Environmental valuation can be used in the valuation of sacred properties and properties of cultural heritage.
- viii. It is used in the simulation of a market where no market exists.
- ix. Environmental valuation is also useful in determining the value of environmental quality and amenity variables that affect prices of marketed goods.

The Economics of Ecosystems and Biodiversity [31] opined that biodiversity and ecosystems value must be mainstay in any economic decision making with the aim of ensuring more sustainable development pathways for all people, and in particular, the poorest. The adoption of an ecosystem approach to the management of natural goods and services is the most logical step to take towards protecting the fundamental value of ecosystem goods and services.

6. Conclusion and Recommendations

The study examined the roles of Estate Surveyors and Valuers in greening the Nigerian economy. Nigeria is a country blessed with large landmass and diverse natural resources but the question is that are these ecosystems used to the benefit of her mass populace? Sustainable development has been carried out and still being carried out to the detriment of the natural capital in Nigeria. This is happening due to the undervaluation and mismanagement of the resources which the stakeholders perceived to be of no economic benefits. To transit to green economy, where improved human welfare, social equity, reduction of environmental dangers and ecological scarcities are enjoyed, the natural capital must be given its priority place. The Estate Surveyors and Valuers with their gamut of experiences should be well involved in ensuring the use of renewable energy instead of fossil fuel in their management properties, adoption of efficient technology that consumes less energy, advising on waste minimization and appropriate waste management approaches. They should equally give consideration to ecosystem services while carrying out development valuation and finally promoting decent jobs that takes cognisance of employee's welfare, job security and career prospects in the profession. It is therefore imperative on the developed countries and UNEP to provide financial assistance to developing countries like Nigeria so as to equally help them formulate policies that will hasten their transition to green economy.

References

- [1] Pearce, D.W., Markandya, A. and Barbier, E. (1989) *Great Britain and International Institute for Environment and Development Blueprint for a Green Economy*. London: Earthscan Pubs.
- [2] Edey, M. (2009) 'The Global Financial Crisis and its Effects', *Economic Papers: A Journal*

- of Applied Economics and Policy 28(3): 186-195.
- [3] Jessop, B. (2012) 'Economic and Ecological Crises: Green New Deals and no-Growth Economies', *Development* 55(1): 17-24.
- [4] Jacobs, M. (2012) 'Green Growth: Economic Theory and Political Discourse', Grantham Research Institute on Climate Change and the Environment Working Paper 92. London School of Economics.
- [5] Zaccai, E. (2012) Over Two Decades in Pursuit of Sustainable Development: Influence, Transformations, Limits, *Environmental Development* 1(1): 79 – 90.
- [6] Brand, U. (2012) 'Green Economy the Next Oxymoron? No Lessons Learned from Failures of Implementing Sustainable Development', *GAIA-Ecological Perspectives for Science and Society* 21(1): 28-32.
- [7] Oni, A. O., Ajibola, M. O., Iroham, O. C. and Akinjare, O. A. (2015) Analysis of Accessibility Impact on Commercial Property Values in Ikeja, Nigeria. Proceedings of the 25th International Business Information Management Association Conference – Innovation Vision 2020: Form Regional Development Sustainability to Global Economic Growth, IBIMA
- [8] Barbier, E., Markandya, A. and Pearce, D.W. (2013) *A New Blueprint for a Green Economy*. Abingdon, Oxon; New York, NY: Routledge.
- [9] Jacobs, M. (1993) *The Green Economy: Environment, Sustainable Development and the Politics of the Future*. Vancouver: UBC Press.
- [10] Barbier, E.B. (2009) *A Global Green New Deal*. Report prepared for the Economics and Trade Branch, Division of Technology, Industry and Environment. UNEP.
- [11] UNDESA (2009) *Technical Note: A Global Green New Deal for Climate, Energy, and Development*, UNDESA.
- [12] UNEP (2011) *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication* UNEP.
- [13] Antonio, J (2012) *The Transition to a Green Economy: Benefits, Challenges and Risks from a Sustainable Development Perspective*. Report by a Panel of Experts to Second Preparatory Committee Meeting for United Nations Conference.
- [14] UNEP (2010) *Green Economy: Developing Countries Success Stories*, UNEP.
- [15] UNCED (2012) *The Future we Want, Outcome of the United Nations Conference on Sustainable Development (Rio+20)*.
- [16] Fareed B. (2012) *Green Economy in the Arab Region*. United Nations Environment Programme (UNEP). TEEB Capacity-building Workshop for MENA Region.
- [17] Green Economy Coalition (GEC, 2012) 'The Green Economy Pocketbook: The Case for Action'. <http://www.greeneconomycoalition.org/updates/green-economy-pocketbook-case-action>. Accessed Friday, June 02, 2017
- [18] International Chamber of Commerce (ICC, 2011) "Ten Conditions for a Transition Towards a Green Economy".
- [19] The Danish 92 Group (2012) *Building an Equitable Green Economy*. The Danish 92 Group Forum for Sustainable Development.
- [20] Redclift, M. R. (2006) Sustainable Development (1987-2005): An Oxymoron Comes of Age, *Horizontes Antropológicos* 12(25): 65 – 84
- [21] Lander, E. (2011) 'The Green Economy: The Wolf in Sheep's Clothing', Amsterdam: Transnational Institute: 6.
- [22] People's Summit (2012) *Another Future is Possible: Texts Drafted on the Basis of Findings of the Thematic Groups of the Thematic Social Forum*. Rio de Janeiro: People's Summit.
- [23] Food and Agriculture Organization (FAO, 2010) *Payments for Environmental Services within the Context of the Green Economy*
- [24] Khor, M. (2012). *Challenges of the Green Economy Concept and Policies in the Context of Poverty, Sustainable Development, Poverty and Equity*. A Report by a Panel of Experts

- to Second Preparatory Committee Meeting for United Nations Conference on Sustainable Development
- [25] Nwosu, F.O., Uhuegbulem I. J. and Ben-Chendo, G. N. (2015). Green Economy: A Tool for Achieving Sustainable Development and Poverty Reduction in Nigeria. *European Journal of Academic Essays* 2(5), pp. 1 – 4.
- [26] Kenner, D. (2014) Who should value nature? Sustainable Business Initiative – Outside Insights. <https://www.icaew.com/-media/corporate/files/technical/sustainability/tecpln13444-who-should-value-nature-web.ashx?la=en> Retrieved Friday, July 29, 2018.
- [27] Halim H. C. (2010) Assessment of the Application of Information and Communication Technology in Real Estate Practice (A Case Study of Lagos Metropolis). A Dissertation Submitted to the Department of Estate Management in Partial Fulfillment of the Requirements for the Award of Masters of Science (M. Sc.) in Estate Management, University of Nigeria, Enugu Campus.
- [28] Stephen, M. and David, C (2015) *The Principles of Real Estate Practice*. 5th Edition https://www.proeducate.com/course/static_files/docs/Mettling_5.pdf Accessed Wednesday, January 17, 2018
- [29] Oluwunmi, A. O., Akinjare, O. A., Ajibola, M. O., Oloke, O. C., (2018) An Evaluation of the Basic Facility Needs of Private University Students in Ogun State, Nigeria. *International Journal of Civil Engineering and Technology*, 9(9) pp. 476 – 484
- [30] Ogunba, A. O. (2013) *Principles and Practice of Property Valuation in Nigeria*. Atlantis Books, Ibadan, Nigeria.
- [31] The Economics of Ecosystems and Biodiversity (TEEB, 2010) *The True Value of Ecosystems* (http://www.bothends.org/uploaded_files/inlineitem/CS12_TEEB_Feb15.pdf) Accessed Saturday, July 01, 2017