

## AN ANALYSIS OF THE ROLE OF GREEN ECONOMY IN PROMOTING INNOVATIVE FOREST DEVELOPMENT IN NIGERIA: A SYNTHESIS FROM THE LITERATURE

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### ABSTRACT

*Nigeria is losing her forest estate at an alarming rate. The country's forest estate which stood at 20% of total land area in the 1970s' shrunk to 7% of total land area in 2007. Many factors such as poor governance, illegal logging, inefficient utilization of forest resources, poor management, unsustainable agricultural practices etc. have been attributed to the high rate of forest loss in Nigeria. The high rate of forest loss in the country is having negative effect on rural livelihood and development of the forest industry sector of the country's economy. The situation is also causing a lot of environmental challenges such as desert encroachment, erosion, and loss of biodiversity, and water scarcity. These have substantially increased the vulnerability of rural livelihood and various key economic sectors to climate change risk. Hence there is the growing recognition among stakeholder that the current model of management in the country's forestry sector is socially, environmentally, and economically unsustainable. It is however envisaged that transition to green economy will help revamp the country's forestry sector and set her on the path of sustainable development while also helping to achieve the three concrete objectives of; economic recovery, poverty reduction, and forest restoration. This paper discusses opportunities for green economy initiatives in the Nigeria forestry sector under the categories- forest management; and forest industry. The study attempts to rationale how transition to green economy (through appropriate green market mechanisms) in the Nigerian forestry sector will help facilitate sustainable development of the sector while also promoting equity, environmental friendliness and climate resilience.*

**Keyword:** *Green Economy, forest resources, sustainable development*

### 1.0 INTRODUCTION

The forest sector is an important sector of the Nigerian economy and has been a major contributor to the national GDP. The forestry sector contributed two-third of GDP and provides employment for about 568,000 people in the 1970s (Kalu & Okojie 2009). However in recent years the forestry sector contribution to the national economy has declined significantly with the sector contributing only 2 per cent of GDP (Amiebenomo, 2002). The current (Business-As-Usual) forest management practices indeed have failed to harnesses the full benefit of Nigeria's forest estate. Poor management practices have compromised the ability of the forestry sector to contribute optimally to the overall well-being of the Nigerian populace (Ogunwusi, 2013). This challenge

has also lead to high rate of deforestation and forest degradation in the country. This condition is now being exacerbated by the emerging climate change risk (Ewah, 2007 and Ogbo et al., 2013). This paradigm is critically challenging for a developing country like Nigeria with high dependence on natural capital.

Despite these challenges, the forestry sector still has great potential to contribute to sustainable development in the country. About 70 per cent of Nigeria's population reside in the rural areas where they are, directly or indirectly, dependent on forest resources (Amiebenomo, 2002). There is therefore a need for re-think of current management practices in the Nigerian forest sector. Adopting green economy initiatives in the Nigerian forestry sector will help promote efficient use of forest resources and contribute to sustainable development of the sector

while also attaining social inclusiveness (Ogunwusi, 2013). This will also make the sector to play active role in climate change mitigation strategies (UNECE, 2013). UNEP (2011) also opined that the forest sector can play a key role in the transition towards a greener economy and a more sustainable society. At the same time the discussion around green economy is leading to an improved appreciation of the monetary and non-monetary value of forest resources. Ten Brink et al (2012) argued that a healthy forestry sector is necessary for attainment of long-term socio-economic development and complementation of efforts to build a green economy that promotes social equity, poverty eradication, and human well-being.

UNEP (2011) defines the green economy as “an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. Green investments generally aim to: reduce carbon emission and pollution; enhance energy and resource efficiency; and prevent the loss of biodiversity and ecosystem services.

We anticipate therefore that embracing the evolving green economy concept will be essential in revamping the country’s forestry sector. Given the huge potential for reforestation and afforestation in Nigeria; this study examined opportunities for transition to green economy in the forestry sector through the application of available green market mechanisms. This can help maximize benefits from the Nigerian forestry sector. This paper discusses green economy opportunities in the Nigeria forestry sector under the categories- forest management; and forest industry.

## **2.0 FOREST MANAGEMENT IN NIGERIA: OPPORTUNITIES FOR GREEN INVESTMENT INITIATIVES**

Greening the forestry sector implies managing it and investing in it as an asset class that produces a wide range of benefits to society (UNEP, 2011). Green investment can be targeted at curbing deforestation and restoration of degraded forests in Nigeria. Forestry in a green economy will sustainably supply raw materials to forest base industries; provide ecosystem services; and meet critical livelihood needs of local communities (Ogunwusi, 2013 and Kalu & Okojie 2009). There are tried and tested forestry related market mechanisms that can help facilitate transition to

green economy in the Nigerian forestry sector thereby helping to promote sustainable management of the forestry sector (UNEP, 2011). These include; Forest certification scheme; CDM base projects such as afforestation and reforestation; and REDD+.

### **2.1 Forest Certification Scheme**

Forest certification schemes are international non-governmental mechanisms for regulating forest management and forest product exploitation and trade. They act as a major driver in creating trade opportunities in sustainable forestry (Søreide & Williams, 2013). Certifications are essential in ensuring effectiveness of green investment initiatives. However, till date none of the forests in Nigeria (neither planted forest nor natural forest) is certified by any certification body. Embracing certification scheme in forest management in Nigeria will be crucial to ensuring sustainable forest resource management and utilization in the country.

Experience from other African countries such as South Africa has shown that certification scheme have huge potential in halting and reversing deforestation and forest degradation while promoting trade in legally harvested forest products (Ham, 2004). Certification scheme can contribute to offsetting global greenhouse gas emissions through reinforcement of forest-based sequestration of carbon (FAO, 2009). Cashore et al (2006) noted that certification can have positive social impact such as improved pay and conditions for workers, the development of community infrastructure and the provision of training. Van Kuijk et al (2009) also observed that good practices such as protected areas within forest management, and reduced impact logging associated with certification scheme are beneficial for biodiversity. In the same vein Zagat et al (2010) also reported that certification has helped reduce biodiversity loss in the tropics.

Links to international markets and the possibility of improved access to high value markets should therefore serve as a motivating incentive for Nigeria to embrace forest certification scheme in order to promote sustainable forest management in the country and facilitate transition to a green economy. Embracing certification scheme will therefore be vital in repositioning the Nigerian forestry sector to take advantage of the growing international demand for environmentally friendly goods and services. UNEP (2011) noted that trade in sustainable forest

products is an important driver of transition to a green economy.

## 2.2 Clean Development Mechanism (CDM)

The CDM scheme allows emission-reduction projects in developing countries to earn certified emission reduction (CER) credits. CERs can be traded and sold, and used by industrialised countries to meet part of their reduction targets under the Kyoto Protocol (UNFCCC, 2007). Relevant forest related green investment initiatives under the CDM scheme include Afforestation and Reforestation. Till date Nigeria's participation in the CDM scheme has been largely limited to the oil and gas sector (Hackenbroch, 2011). Nigeria is yet to harness the potential benefits of CDM projects in the forestry sector. However opportunities exist for the country forestry sector to benefit from the CDM scheme.

Nevertheless, forest base CDM projects hold huge prospects in fulfilling government's commitment to mitigation of climate change impact. The CDM provides Nigeria with an opportunity to attract and increase public and private investment in the forestry sector and reward sustainable forest management. Dahiru (2011) estimates that consistent implementation of forest base CDM projects such as afforestation and reforestation could reduce Nigeria's deforestation rate (which currently represents 3.5%) by at least 80%. Moreover, the additional benefits associated with forest base CDM projects such as attraction of foreign investment, development of forest industries, provision of employment, rural development and biodiversity conservation (Smith, 2002) will help the country to fulfil her commitment to climate change mitigation and adaptation while at the same time attaining sustainable development.

The growing carbon market should serve as an incentive for the Nigerian forestry sector to embrace the CDM scheme. UNEP (2011) noted that the value of global transactions of carbon credits derived from forestry projects rose by 34 per cent year on- year to US\$ 237 million in 2011. Currently, Africa has not been significantly involved in such carbon markets. Sukhdev et al (2011) noted that carbon markets may provide developing countries with trade opportunities and act as catalyst for transition of the forest sector towards a green economy. Carbon market has been observed to create jobs and contribute to poverty reduction (Smith, 2002 & Sukhdev et al., 2011).

## 2.3 REDD+ Green investment initiative

The REDD+ scheme was established to cater for other forest base carbon project such as forest conservation which are not eligible under the CDM scheme (Sukhdev et al., 2011). The REDD+ scheme is crucial in curbing deforestation and forest degradation which has hindered the ability of the Nigerian forest to deliver maximum benefits to stakeholders (Ogunwusi, 2013). REDD+ presents an excellent opportunity for developing countries like Nigeria to protect her forests and ensure their contribution to a green economy (Watson et al., 2013). Clear links exist between REDD+ and green economy objectives, both of which call for a change in the business-as-usual economic development in order to slow the loss of natural capital (Costenbader, 2011).

Watson et al (2013) noted that REDD+ aim is to address market, policy, and institutional failures that undervalue the environmental services provided by the forest ecosystem, while protecting the rights of those who rely on the forests. Essentially REDD+, is an investment focusing on retaining or enhancing natural capital, and provides an opportunity to enable countries to move towards realizing green development (Sukhdev et al., 2011). REDD+ investments are focused on maintaining or enhancing natural capital, either through investments in forests or through slowing, halting or reversing drivers of deforestation and forest degradation (Sharma & Chaudhry, 2013). The scheme can enable forest owners to capture more of the value of the environmental services provided by their forest (UNEP, 2011).

Ten Brink et al (2012) suggests that schemes such as the REDD+ that emphasises on investments in natural capital will create more jobs in the long run and promote sustainable development and facilitate transition to green economy. In the same vein, UNECE (2009) reported that REDD+ is an opportunity to mainstream the inclusion of natural capital into decision making processes. UNEP (2011) found that higher and more resilient growths are achieved by limiting potential damages of deforestation and increasing the benefits of forest conservation.

Thus REDD+ would deliver not only direct investments in forests but it would also help to lower

thresholds for other investments into ecosystem services and the conservation of biodiversity (Sukhdev et al., 2011). REDD+ can deliver biodiversity conservation as an additional benefit for mitigation and development. Ten Brink et al (2012) observed that REDD+ deliver mitigation, conservation and development benefits that conforms to a Green Economy paradigm. Nigeria can learn from countries like Indonesia that have integrated REDD+ into its green economy approach. Countries like Ethiopia and Costa Rica have demonstrated that integrating REDD+ with green economy will produce positive synergies (Ten Brink et al., 2012). Integrating REDD+ within planning and investments for a green economy transition at an early stage could allow for synergistic opportunities to be maximised (Watson et al., 2013).

### **3.0 FOREST INDUSTRY IN NIGERIA: OPPORTUNITIES FOR GREEN INVESTMENT**

The forest industry sectors can make a significant contribution towards meeting green economy objectives (UNEP, 2011). Green investment initiative can enhance compliance with green economy objectives and enable attainment of sustainable development in the Nigerian forest industry sector. Opportunities for green investment in the Nigerian forest industry sector include; adoption of green (Cleaner) technology for efficient and effective wood utilization (waste reduction, efficient wood waste use e.g. charcoal making), wood reuse, and wood recycling. Among the advantages of these initiatives is reduction in the rate of deforestation and increased lifespan of wood in service leading to reduction in the rate of forest exploitation (Ogunwusi, 2013). The various investment options for promoting transition to green economy in the forest industry sector are subsequently discussed.

#### **3.1 Adoption of cleaner technology**

In Nigeria, more than 1.5 million tons of wood wastes are generated annually in form of saw dusts, flakes, slabs, offcuts, and planks in construction sites, etc. (Ogunwusi, 2009). Waste generation in the Nigerian forest industries is massive due mainly to obsolete wood conversion technology in-use in these industries. Most sawmills in Nigeria have depreciated machineries, low recovery rate of less than 49% and lacks the capacity to process small diameter logs from forest plantations (FOSA, 2001). The traditional

charcoal production technique in Nigeria is unsustainable and lead to low conversion efficiency. Charcoal production in Nigeria is far more damaging to the environment than firewood (Kammen & Lew, 2005). Kehinde & Awoyemi (2009) reported that wood residue accounts for about 60% by volume in sawmills and between 40-70% by volume in plywood industries.

The low recovery rate of Nigerian forest industries and her low capacity to process small diameter logs from tree plantations have been observed to be a major driver of deforestation and over-exploitation of forest resources in the country (Ogunwusi, 2013). Nigeria can therefore benefit from green economy approach by adopting cleaner technologies in the forest industry sector so as to promote efficient and effective utilization of forest resources and reduce the rate of forest degradation and deforestation.

Given the growing importance of sustainable forest resource supply; Nigeria can no longer ignore the need for efficient and effective forest resources utilization. Adoption of a cleaner technology for efficient and effective forest resources utilization will therefore be crucial in Nigeria match to sustainable development and transition to green economy. Although it is possible to increase the production rates of forests and plantations through more intensive management, wood resources are nevertheless finite. Evolving a new way of efficient and effective wood resources utilization is thus vital for attainment of sustainable development and transition to a green economy. Moreover the rising cost of kerosene and cooking gas are likely to trigger supply crisis for firewood and charcoal. UNDP (1998) supports this paradigm shift by opining that consumption patterns today must be changed to advance human development tomorrow.

#### **3.2 Wood waste utilization (wood reuse and recycle)**

Wood reuse and recycling are becoming important in view of their roles in stemming climate change. Currently markets for wood reuse and recycling in Nigeria are not being explored. Used wood and wood waste generally end in the landfill. However experienced from developed countries such as United Kingdom shows that wood reuse and recycling can create jobs and reduce rate of forest exploitation (Ogunwusi, 2013).



Most of the wood wastes generated in Nigeria are burnt off, constituting hazards to the environment. Opportunity for wood waste utilization in Nigeria is not yet being fully explored. Although wood wastes are being processed into briquettes for domestic energy utilization at small scale in few isolated cases in Nigeria; this however can be scaled up to promote industrial energy generation from wood waste. Nigeria can learn from developed countries where wood wastes are processed and used for both domestic and industrial energy generation (RÖser et al., 2008).

It is anticipated that wood energy will play a big part in Nigeria's future energy need. Wood waste utilization in Nigeria can be scaled up to wood pellet production and co-fired for electricity generation (Ofoegbu, 2010). Oladeji et al (2009) found that wood waste briquettes production enterprise can be very profitable for small businesses and communities in Nigeria. Sustainable wood waste utilization therefore is an opportunity for Nigeria to promote sustainable development and transition to green economy.

#### 4.0 CONCLUSIONS

About 70% of the Nigerian populations are resident in rural areas where they are highly dependent on forest resources. Low economic opportunity, population increase, and poverty in these areas will necessitate the people to continue to depend on forest resources and these are more likely to encourage persistence of forest degradation and deforestation in these areas. Despite this challenging trend, there is enough evidence to believe that transition to green economy in the Nigerian forestry sector will help promote sustainable management and ensure that the forest resources delivers maximum benefits to all stakeholders. Evidence from literature studies proves that adoption of green economy initiatives in the Nigerian forestry sector will ensure:

1. Sustainable wood consumption and production: adoption of green economy initiatives will ensure that patterns of consumption and production of forest products are truly sustainable;
2. Reduce carbon emission in the forest sector: adoption of green economy initiatives will ensure that the forest sector makes the best

possible contribution to mitigation of, and adaptation to, climate change;

3. Generation of decent green jobs: adoption of green economy initiatives will ensure that forestry jobs are decent and socially inclusive;
4. Valuation of forest ecosystem services: adoption of green economy initiatives will ensure that forest ecosystem services are properly valued and paid for;

#### References

1. Amiebenomo, O. 2002. Tropical secondary forest management in africa: Reality and perspectives Nigeria Country Paper. *Written for the fao/ec Inv/gtz workshop on tropical secondary forest management in africa: Reality and perspectives In collaboration with ICRAF and CIFOR Nairobi, Kenya, 9-13 December 2002*
2. Cashore, B., Gale, F., Miedinger, E., and Newsom, D. 2006. Confronting sustainability: Forest certification in developing and transitioning countries. *Report Number 8. Yale School of Forestry and Environmental Studies.*
3. Costenbader, J. 2011. REDD+ benefit sharing: a comparative assessment of three national policy approaches. *UN-REDD Programme.*  
<http://www.undp.org/content/dam/undp/library/Environment%20and%20Energy/Climate%20Change/REDD+%20benefit%20sharing%20-%20a%20Comparative%20assessment%20of%20three%20national%20policy%20approaches.pdf> [17 November, 2013]
4. Dahiru, S. 2011. REDD+ and CDM. *Presented at Stakeholders' workshop on enhancing capacity for clean development mechanism (CDM) in Nigeria.*  
[http://nigeria.acp-cd4cdm.org/media/333547/redd-cdm\\_salisu.pdf](http://nigeria.acp-cd4cdm.org/media/333547/redd-cdm_salisu.pdf) [28 November, 2013]
5. Ewah, O. 2007. Strengthening Energy and Ecosystem Resilience in Nigeria.

- Sustainable Energy Watch, *HELIO International*. <http://www.helio-international.org/Nigeria.En.pdf> [16 November, 2013]
6. FAO. 2009. Green Jobs. An international journal of forestry and forest industries. *Unasylva*, Vol. 60, issue 3. ISSN 0041-6436. <ftp://ftp.fao.org/docrep/fao/012/i1025e/i1025e01.pdf> [28 November, 2013]
  7. FOSA. 2001. Forestry Outlook Studies in Africa: Nigeria. Ministry of natural resources and tourism. <http://www.fao.org/docrep/004/ab592e/AB592E01.htm> [12 August 2009]
  8. Hackenbroch, I. 2011. Nigeria: CDM Market Brief. *Published by: Germany Trade and Invest Gesellschaft für Außenwirtschaft und Standortmarketing mbH Villemombler Str. 76, 53123 Bonn* <http://www.jiko-bmu.de/files/english/application/pdf/cdm-markt-nigeria-english.pdf> [20 November, 2013]
  9. Ham, C. 2004. Forest Certification in South Africa. *Paper presented at the Symposium Forest Certification in Developing and Transitioning Societies: Social, Economic, and Ecological Effects Yale School of Forestry and Environmental Studies New Haven, Connecticut, USA* [http://www.yale.edu/forestcertification/symposium/pdfs/southafrica\\_symposium.pdf](http://www.yale.edu/forestcertification/symposium/pdfs/southafrica_symposium.pdf) [27 November, 2013]
  10. Kalu, C and Okojie, C.E. 2009. Economic Contributions of Forests in Nigeria 1970-2000 *Research Journal of Social Sciences*, 4: 69-73, 2009 © 2009, *INSInet Publication*
  11. Kehinde, A. and Awoyemi, T. 2009. Analysis of Economic Efficiency in Sawnwood Production in Southwest Nigeria. *J Hum Ecol*, 26(3): 175-183 (2009) <http://www.krepublishers.com/02-Journals/JHE/JHE-26-0-000-09-Web/JHE-26-3-000-09-Abst-PDF/JHE-26-3-175-09-1833-Kehinde-A-L/JHE-26-3-175-09-1833-Kehinde-A-L-Tt.pdf> [25 November, 2013]
  12. Ofoegbu, C. 2010. MSc. Thesis: An evaluation of the socio-economic impact of timber production with and without the inclusion of biomass energy production
  13. <http://etd.sun.ac.za/browse?type=author&value=Ofoegbu,%20Chidiebere> [15 January, 2013]
  14. Ogbo, A., Ndubuisi L., and Ukpere, W. 2013. Risk Management and Challenges of Climate Change in Nigeria. *J Hum Ecol*, 41(3): 221-235 (2013) [http://www.krepublishers.com/02-Journals/JHE/JHE-41-0-000-13-Web/JHE-41-3-000-13-Abst-PDF/JHE-41-3-221-13-2390-Ukpee-W/JHE-41-3-221-13-2390-Ukpee-W-Tx\[5\].pmd.pdf](http://www.krepublishers.com/02-Journals/JHE/JHE-41-0-000-13-Web/JHE-41-3-000-13-Abst-PDF/JHE-41-3-221-13-2390-Ukpee-W/JHE-41-3-221-13-2390-Ukpee-W-Tx[5].pmd.pdf) [10 November, 2013]
  15. Ogunwusi, A. 2013. Green Investments Required in the Forest Products Industry in Nigeria. *Developing Country Studies*. Vol.3, No.3, 2013. ISSN 2224-607X (Paper) ISSN 2225-0565. <http://www.iiste.org/Journals/index.php/DCS/article/view/4666> [15 November 2013]
  16. Oladeji, J., Enweremadu, C., and Olafimihan, E. 2009. Conversion of Agricultural residues into biomass briquettes. *JAAAR* 5(2):116-123.
  17. UNDP. 1998. Changing today's consumption patterns -for tomorrow's human development, Overview. *Human Development Report 1998*. [http://hdr.undp.org/en/media/hdr\\_1998\\_en\\_overview.pdf](http://hdr.undp.org/en/media/hdr_1998_en_overview.pdf) [29 June, 2013]
  18. UNECE.2009. The forest sector in the green economy. *Geneva timber and forest discussion paper* 54. <http://sustainabledevelopment.un.org/content/documents/807DP-54.pdf> [20 November, 2013]
  19. UNEP. 2011. Forests: Investing in natural capital, Towards a green economy. [http://www.unep.org/greeneconomy/Portals/88/documents/ger/GER\\_5\\_Forests.pdf](http://www.unep.org/greeneconomy/Portals/88/documents/ger/GER_5_Forests.pdf) [12 November, 2013]
  20. UNFCCC. 2007. The Kyoto protocol mechanisms: international emissions trading clean development mechanism joint implementation.

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- <http://unfccc.int/resource/docs/publications/mechanisms.pdf> [29 November, 2009]      corruption/downloadasset/2974. [28 November, 2013]
21. Ralph, E. and Keith, M. 2004. Delivering the bioenergy triple bottom line to the global community. Thames Valley Energy Ltd., Newbury, England [Online] <http://www.tvenergy.org/pdfs/bioenergy-triple-bottom.pdf> [December 1, 2008].
22. RÖser, D., Asikainen, A., Rasmussen, R., and Stupak, I. 2008. Sustainable use of forest biomass for energy. A synthesis with focus on the Baltic and Nordic region. Springer publisher The Netherlands: pp 15-78.
23. Sharma, V. and Chaudhry, S. 2013. Review Article: An Overview of Indian Forestry Sector with REDD+ Approach. Hindawi Publishing Corporation, ISRN Forestry, Volume 2013, Article ID 298735. <http://www.hindawi.com/isrn/forestry/2013/298735/> [ 28 November, 2013]
24. Smith, J. 2002. Afforestation and reforestation in the clean development mechanism of the Kyoto Protocol: implications for forests and forest people. *International Journal of Global Environmental Issues*, Vol. 2, Nos. 3/4, 2002 [http://www.cifor.org/publications/pdf\\_files/articles/afforestation.pdf](http://www.cifor.org/publications/pdf_files/articles/afforestation.pdf) [28 November, 2013]
25. Søreide, T. and Williams, A. 2013. Certified integrity? Forest certification and anti-corruption. U4 Issue January 2013 No 1. <http://www.u4.no/publications/certified-integrity-forest-certification-and-anti->
26. Sukhdev, P., Prabhua, R., Kumara, P., Bassic, A., Patwa-Shaha, W., Entersa, T., Labbatea, G., and Greenwalta, J. 2013. REDD+ and a Green Economy: Opportunities for a mutually supportive relationship. *UN-REDD PROGRAMME POLICY BRIEF issue #01*
27. Ten Brink P., Mazza L., Badura T., Kettunen M., and Withana S. (2012) Nature and its Role in the Transition to a Green Economy
28. van Kuijk, M., Putz, E., and Zagt, R. 2009. Effects of forest certification on biodiversity. *Tropenbos International, Wageningen, the Netherlands*.
29. Watson, C., Brickell, E., and McFarland, W. 2013. Integrating REDD+ into a green economy transition; Opportunities and challenges. *ODI Report*. <http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8424.pdf> [17 November, 2013]
30. Zagt, J., Sheil, D., and Putz, E. 2010. Biodiversity conservation in certified forests: An overview in Sheil, D., Putz, F.E. and Zagt, R.J. (eds.), *Biodiversity conservation in certified forests. Tropenbos International, Wageningen, the Netherlands*.