REFLECTIONS ON ENVIRONMENTAL SECURITY, INDIGENOUS KNOWLEDGE AND THE IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT IN NIGERIA

A. O. Ayeni
Department of Geography, University of Lagos, Lagos, Nigeria
and
F.B. Olorunfemi
Nigerian Institute of Social and Economic Research, Ibadan, Nigeria
E-mail: ayeniao2000@yahoo.com +2348035894730

Abstract
The crucial role of environmental factors in determining the fate of human beings and human societies remains a compelling argument, though it is often made anecdotally rather than through rigorous empirical research. Nigeria's high vulnerability index, the increasing environmental insecurity as a developing nation and the predicted adverse impacts of climate change portend great danger for sustainable development. A crucial issue often raised is on the scope and extent to which Nigeria's involvement in several sustainable development dialogues, and signatory to environmental conventions have enabled growth to take cognisance of challenges associated with environmental insecurity. This paper, therefore, reflects on the linkages between environmental security and indigenous knowledge and the usefulness of these for enhacing sustainable development in Nigeria. Specific issues examined in the paper include an exploration of the linkages between environmental security and indigenous knowledge, environmental security and sustainable development and, importantly, recent efforts at addressing sustainable development challenges in Nigeria. We argued that to promote environmental security for sustainable development, indigenous knowledge should be included in all local, state and national development actions, plans and discussions.. It is therefore important for government, non-state actors and environmental stakeholders to promote the effectiveness of indigenous knowledge to promote prtactices and policies that will enhance environmental security and by extension sustainable development. The implication of all this is that a paradigm shift is required, whereby indigenous knowledge drives our development efforts in Nigeria.

Keywords*:* Environmental security, indigenous knowledge, climate change, sustainable development

Introduction

The crux of this paper is on the link between environmental security and indigenous knowledge for optimizing sustainable development and how these linkages can be positively explored for research, policy and practice in Nigeria. The most serious problems facing the world today include water and food supply crises, extreme volatility in energy and food prices, rising greenhouse gas emissions, severe income disparity, chronic fiscal imbalances and terrorism (UNU-IHDP and UNEP, 2012; MEA, 2005; UNDP, 1994). These development challenges either stem from environmental mismanagement or inequality, or both. Aside from the chronic fiscal imbalances that mostly concern the developed economies, developing countries are the most vulnerable to all of these risks.

As rightly observed by OECD (2011), the key question is if (and how) inter-temporal considerations in resource use and environmental goals can be reconciled with growth and poverty reduction in the developing world to ensure security for all. In recent times, considerable studies on achieving sustainable development have focused mainly on environmental security, climate change and roles of indigenous knowledge. For instance, this is evidenced by the introduction of a section on indigenous knowledge for the first time in the Inter Governmental Panel on Climate Change (IPCC) Fifth Assessment Report (UNFCCC, 2013). Also, understanding the nature and relevance of indigenous knowledge for climate change adaptation is a new and rapidly expanding area of collaborative investigation, involving indigenous peoples, local communities and scientists. According to UNFCCC (2013),

several literature reviews of that body of research have been published in the last five years. Roncoli, Crane and Orlove (2009) list 192 published papers in a recent review of epistemological and methodological approaches to climate change in cultural anthropology, while Crate (2011) references 136 sources on climate and culture in an article for the *Annual Review of Anthropology*. Looking specifically at farmers' responses to climate predictions, Roncoli (2006) surveyed 154 references. Most recently, the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the United Nations University (UNU) (Nakashima et al., 2012) cite over 300 references in *Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation*, which provides an overview of key issues and areas of research. The linkages between indigenous knowledge and environment sustainability continue to grow in contemporary academic and policy discuss.

The causes, manifestations, consequences of environmental security are so varied that the internal representation of the term is generally hidden from view. Ironically, one could say that environmental security is term evolved from mixture of military language and more recently by traditional environmental groups and social thinkers, and as a subject, it is cast very powerfully in managerial terms. While this is useful in predictable ways, the term is not being used deeply enough. According to Mathews, (1989) the term environmental security originated after the fall of the Berlin Wall in 1989 and referred to the possible rise of conflicts over natural resources. More recently, however, environmental security now focused on guaranteeing the functioning of the ecosystem as the basis for human wellbeing and existence.

The United Nations Development Programme (UNDP) 1994 Human Development Report (UNDP, 1994) which specifically foccussed on human security argued that environmental security aims are to protect people from the short- and long-term ravages of nature, man-made threats in nature, and deterioration of the natural environment. On a macro scale, lack of access to clean water resources, air pollution, environmental degradation and climate change are some of major environmental threats affecting both developing and developed countries. However, the developing countries are worst hit by these threats. Environmental security manifests itself in individual lives, households, communities (includes those traditionally defined and often described as such - women, ethnic groups, etc), regions, nation, states, and globally. An environmental problem in one country can be so serious that it endangers other countries to the extent that the right of self-defense could conflict with national sovereignty (Florini and Simmons, 1998). Environmental security at the higher levels should be viewed as rooted in security at the lower ones.

Nigeria, and the country's high vulnerability index as a developing nation, the adverse impacts of climate change will surely affect the core areas of our national circumstances, which present our country as one with: low-lying coastal area, arid and semi-arid areas liable to accelerated forest degradation, areas prone to natural disasters, areas liable to drought and desertification, areas of high urban, atmospheric, pollution, fragile ecosystems, including mountainous ecosystem; and economy highly dependent on income generated from the production, processing, export and/or consumption of fossil fuels and associated energy intensive products (FGN, 2012a, Olorunfemi and Onwuemele, 2011; Olorunfemi and Raheem, 2007; Olokesusi and Olorunfemi, 2006).

Therefore, the imperatives for sustainable development lies in the fact that Nigeria has been a key African player and participant in the United Nations Conference on Sustainable Development since the first conference in Rio de Janeiro in 1992. More than twenty years after, Nigeria is experiencing a resurgence of growth which was only experienced in the 1960s. As reported by National Bereau of Statistics (NBS) (2012) and National Planning Commission (NPC) (2012), the economy has been growing 6 to 7 percent in the past eight years. Also, the Economist and International Monetary Fund (2011) state that Nigeria's economy grew at an annual average of 8.9 percent between 2001 and 2010 which makes it one of the world's 10 fastest growing economies. This raises question

on the scope and extent to which Nigeria's involvement in several sustainable development dialogues, and signatory to environmental conventions have enabled growth to take cognisance of challenges associated with environmental insecurity. In order to effectively address the concerns of this paper as discussed in this first section, the following sections explores the linkages between environmental security and indigenous knowledge, environmental security and sustainable development and, importantly, recent efforts at addressing sustainable development challenges in Nigeria.,

Exploring the linkages between environmental security and indigenous knowledge

Fundamental changes in assumptions about life, economics, and culture are necessary to assure environmental security provided the issues surrounding security in our environment is understood and addressed properly. There are numbers of environmental security issues that may be of value for policy consideration particularly the role of indigenous knowledge. This has been identified by so many authors (including Page, 2000; Rusinga and Maposa, 2010; Khagram and Ali, 2006; Mason and Muller, 2008; Floyd and Matthew, 2013) but their findings hardly rated for importance by decision/policy makers in most developing nations. From a military perspective, environmental insecurity resulting from environmental factors e.g. conflict if to be prevented must focus on (Floyd and Matthew, 2013):

- Force Protection, protecting health of the soldier to carry out the mission. This should remain priority from peacetime to operations other than war to war;
- Multinational force compatibility to ensure similar environment, safety and health standards are achieved to protect coalition forces to carry out the mission. This should remain priority from peacetime to operations other than war to war; and
- Environment and human health protection to reduce present and future damage and costs. This is along the lines of controlling collateral damage and strategic use of natural resources in such a way that military action does not create widespread devastation of environment and effects to public health as was the case with the Kuwait oil fires. Placing emphasis on this issue, in support of Laws of War, may greatly reduce post-war, operations other than war, activities/costs by both military and civilian government and non-governmental organizations.

On the other hand, it may be valuable to separately focus on the components of human security - food security, water security amongst others (UNDP 1994; Floyd and Matthew, 2013). Economic development, population growth and poor resource management have combined to alter the planet's natural environment in dramatic and alarming ways. According to Floyd and Matthew, (2013), many scholars and practitioners have raised questions on the operational utility and analytical appropriateness of linking environmental issues with security along the following lines:

- Threats to well-being are fundamentally different from military threats;
- Overly broad definitions of security render the term useless;
- Environmental security is merely another tactic used by developed countries to impose their values on developing countries and infringe upon their sovereignty;
- there is a fundamental mismatch between the means required for sustainable development, marked by transparency, cooperation and public participation, and the conflict orientation of security institutions;
- Environmental security rhetoric encourages thinking that could lead nations to undertake military intervention in the name of protecting "global" resources;
- Empirical findings that environmental scarcities contribute to violent conflicts are questionable, as environmental factors are at best tangentially related to conflict and in any case are overshadowed by more important socio-political and economic variables

Nonetheless, of much importance are noteworthy obstacles impeding the seal to promote global environmental security (Steiner et al., 2003). These obstacles include but not limited to: multinational corporations which exploit, destroy, and then move on to greener pastures, leaving environmental degradation and destruction of communities in their wake; the tradition of the open ocean being fair game for any country that wishes to exploit its resources, regardless of the cost to the rest of the planet; the perception in developing countries that it's only fair that they be free to squander their natural resource capital just as developed countries; and drive for short-term profit at the expense of long-term sustainability. Environmental security discussions should adopt a broader and more humanitarian focus. It is not merely a matter of national resilience in the future, but of the survival of disaffected individuals throughout the world in the here and now. Environmental security should take into consideration global interests and rights of future generations.

According to Falkenmark and Folke (2002), this forms the ethics on socio-eco-hydrological catchment management to secure the capacity of the life support system, and on a capacity to sustain the production of food and ecological services under conditions of change and uncertainty. The challenge, therefore, is how to achieve a secure environment with a capacity to absorb sustainable development and continuous change, without losing the value and stability of indigenous knowledge. The challenge should not only be viewed as local issues rather addressed from global perspective and / or dimension. In terms of ethical implications, it implies that 'when indigenous knowledge in environmental security for sustainable development applied at the global scale' is as much a philosophy as a scientific concept. This links up with parallel debates in cultural, ethical, and religious values on the interaction of humans with nature and science (Chuvieco, 2012; Galván 2012).

On the other hand, Indigenous peoples and traditional communities around the world have over the centuries developed a close and peculiar connection with the lands, waters and environments in which they live and work. In recent time, it has become clear that this traditional knowledge garnered will be a valuable resource in resource management and environmental security. Kirsty (2010) puts it thus "In recent years, there has been an increasing realization that the observations and assessments of indigenous groups provide valuable local level information, offer local verification of global models, and are currently providing the basis for local community-driven resource management and adaptation strategies to global environmental change that are way past the planning stage and are already being implemented and tested".

Traditional or indigenous Knowledge refers to the knowledge, innovations and practices of Indigenous Peoples (Kirsty 2010). Ajibade (2003) envisages indigenous Knowledge as the term being used to describe the knowledge systems developed by a community as opposed to the scientific knowledge that is generally referred to as 'modern' knowledge. Unlike Western science, indigenous knowledge is usually holistic, not reductionist, and passed down orally, not written down. In many cases, indigenous knowledge is more practical than theoretical, grasped only through long experience (Agrawal 2011, Kirkland, 2011). Indigenous knowledge is also empirical, based on observation and experiment, as people developing and using traditional knowledge use the same "mental operations" as those engaged in Western practical science (Goodenough 2011). Indigenous knowledge is the basis for local-level decision-making in many rural communities. It has value not only for the culture in which it evolves, but also for scientists and planners striving to improve conditions in rural localities (Robinson and Herbert, 2001).

Local communities have their own indigenous ways to manage their immediate environment in order to sustain available resources such as water, soil amongst others. It also emphasizes that the environment which could be ecologically adaptable should be promoted. It has been basis of community coping practices that have helped vibrant communities survive natural extremes over centuries. In order to differentiate IK from western scientific knowledge systems, several scholars have defined IK based on their perception of the term and / or subject. These scholars include but not limited to Van der Bleik

and van Veldhuizen (1993), Brouwers (1993), Scoones and Thompson, (1994), Warren *et al* (1995). In their own view Chadwick et al., (1996). How "original" is to be defined is uncertain and highlights the difficulty in answering questions relating to whether external knowledge can become indigenous and, if so, when?. In respective of the definition, traditional environmentalists have not been very good at translating the indigenous knowledge definitions and their concern for the natural environment to the new realm of environmental insecurity, even though it has been among the earliest environmental threats resulting from nature and anthropogenic activities.

The increasing connection between the information assessing agendas of the scientific community and the various forces driving towards globalization has not been remotely addressed by anyone. The gap would have be best filled using IK but the fundamental roles of indigenous knowledge in sustaining the livelihoods of people have often been neglected in most urban and rural areas. There are no formal interventions that seek to encourage people to use the local knowledge to conserve our immediate environment. Studies on the role of indigenous knowledge in environmental security could provide important information for development of policies that support such knowledge for human sustenance.

Historically, the traditional knowledge of peasants has enabled them to survive difficult and often changing environments throughout history. This vast reserve of knowledge has potential to contribute to scientific knowledge and development, but it has not been given the recognition it deserves. Traditional knowledge is constantly evolving to support lives and livelihoods. It supports environmental conservation for peoples and communities across the world and it is the very foundation of our healthy environment. Indigenous knowledge system relating to the sustainable management and utilization of biological resources in the environment is not yet thoroughly explored in accordance with the holistic understanding of the indigenous structures and institutions of the culture, traditions, beliefs and practices of the tribe. Turning everything into information as a preliminary step before turning it into a commodity (including the environment, traditional knowledge, and personal genetic codes) is the greatest threat to environmental security

In Africa, local communities had well-developed traditional indigenous knowledge systems for environmental management and coping strategies, making them more resilient to environmental change. This knowledge had, and still has, a high degree of acceptability amongst the majority of populations in which it has been preserved. These communities can easily identify with this knowledge and it facilitates their understanding of certain modern scientific concepts for environmental management including disaster prevention, preparedness, response and mitigation (Kamara, 2013).

In the traditional African worldview, environmental resources (land, water, animals and plants) are not just production factors with economic significance but also have their place within the sanctity of nature. Certain places have a special spiritual significance and are used as locations for rituals and sacrifices, for example, sacred grooves, shrines, mountains and rivers. These locations are quite often patches of high biodiversity which are well conserved and protected by the community. For example, the traditional people of Northern Ghana, gods, spirits, shrines, ritual crops and animals, food items and cash crops are all inter-related (Kamara, 2013).

Indigenous Knowledge is important in the sense that **i**n the emerging global knowledge economy, a country's ability to build and mobilize knowledge capital, is equally essential for sustainable development as the availability of physical and financial capital (World Bank, 1997). The basic component of any country's knowledge system is its indigenous knowledge. It encompasses the skills, experiences and insights of people, applied to maintain or improve their livelihood. Traditional knowledge is constantly evolving to support lives and livelihoods which support human sustenance.

Indigenous Knowledge is a social capital for the poor and constitutes their main asset in their efforts to gain control of their own lives hence, its preservation is important particularly not only

to ensure livelihood but ensuring environmental security. Utilizing Indigenous Knowledge helps to increase the sustainability of development efforts because the Indigenous Knowledge integration process provides for mutual learning and adaptation, which in turn contributes to the empowerment of local communities particularly in ensuring environmental security. Indigenous rural communities are considered as the custodian of indigenous knowledge. They identify themselves very closely with their natural habitat and use their traditional skills in the management of ecological resources as their very existence is based on these resources. Thus, drawing sustenance as well as sustain the ecology becomes an integral part of their culture. For centuries, the tribal/ethnics, rural/urban communities have been effectively managing their natural resources and maintaining ecological balance using a wide range of traditional practices and self-imposed rules evolved over a period.

The focus of Indigenous Knowledge is to establish the role of cultural practices through which communities consume, sustain and conserve natural resources for livelihood and maintain equilibrium. It also to keep into account (through knowledge transformation) the local ecology, environment and sustainability and evolve strategies which could be environmentally sustainable and based on local knowledge and practices.

Environmental security and sustainable development

Environmental security and sustainable development are mutually reinforcing concepts and directions for policy but they are not the same thing. Environmental security focuses more on preventing conflict and loss of state authority due to environmental factors, as well as the additional military needs to protect their forces from environmental hazards and repair military-related environmental damages *(*Floyd and Matthew, 2013*)*. Environmental security examines threats posed by environmental events and trends to individuals, communities or nations. It may focus on the impact of human conflict and international relations on the environmental, or on how environmental problems cross state borders. The Millennium Assessment Project assessed definitions of environmental security and created a synthesis definition: Environmental security is environmental viability for life support, with three sub-elements; preventing or repairing military damage to the environment, preventing or responding to environmentally caused conflicts, and protecting the environment due to its inherent moral value (Munang et al, 2011).

On the other hand sustainable development focuses on environmentally sound development that is economically, financially, socially, and environmentally sustainable. It is a key aspect of the condition of environmental security and should be promoted through a variety of mechanisms including education, steering national economies, subsidy programs, promoting green technology innovation, diffusion and implementation, and strengthening multilateral environmental agreements. The basic framework for understanding the relationship between environment and security is the Millennium Ecosystem Assessment which looks at all the functions of ecosystems and the services they deliver to people and nature. For instance, there is increased evidence of how ecosystem degradation undermines food production and the availability of clean water, threatening human health, livelihoods and, ultimately, societal stability. Our ecosystems provide a diverse range of food sources that support entire agricultural systems but their value to food security and sustainable livelihoods is often a function of environmental security which has however be compromised with human form of negligence (Munang et al. 2011). Therefore, it is important to examine the effectiveness of environment security and determine ways in which it can be improved and how its standards can be strengthened since, sustainable development is the needs of the present without compromising the ability of future generations to meet their own needs. The fear of moving away from the intractable dichotomy of either socio-economic development or environmental conservation and the consequence of the difficulties of attaining sustainable development will be astounded while opening new ways of thinking about the importance of securing solutions to future global, regional and local problems (Rockström et al., 2009) and of course,

finding ways of simultaneously meeting immediate social needs and long-term ecosystem needs, to secure social and economic development (Falkenmark and Rockström, 2004).

Usefulness of indigenous knowledge for environmental security and sustainable development

While indigenous knowledge practices relied on vibrant and reliable principles of interaction between humans and environment (Shaw et al 2009), the policy context for its sustenance in management of environmental issues still remain undefined at the expense of scientific knowledge and technology. In the last decade, the explosion in population, accelerated urbanization and income growth have become unsustainable. They are generating growing and competing demands on food and on natural resources such as soil and water as well as the wider environment. In this context, the idea of indigenous knowledge seems an attractive and meaningful solution. This can be achieved via social change ideally through non-violent mass-based movements, mobilized through an organization that ensures that collective wisdom is employed in goal setting, strategizing and sustaining the change.

The problem in reality is that changing or redirect human behavioral attitude and perception towards a change is quite difficult, and accepting ideals which can actually bring about changes are even more difficult. Many factors other than people's attitude and perceptions and participation in sustainable development lies the understanding of our immediate environment, and the environmental security issues should be best captured through people's long stand and large scale knowledge. Meanwhile, for indigenous knowledge to be attractive by younger generation, the desires for change have to be fostered by present day traditional environmentalist through day-to-day research battles that showcase the relevance of indigenous knowledge in sustainable development.

Most urgent environmental security issues are related to scarcity of renewable resources like water and land. There is a need for environmental policy reform, in light of the mismatch between existing global management capacity and likely threats to environmental resources. Sustainability and integrated protection of the environment and development are closely linked. In Africa, environmental insecurity has become the major threat to the countries' economy and therefore portends great danger to the increasing population. It has become a global issue of critical importance, increasingly acknowledged as one of the main challenges to sustainable development. Nigeria has been facing and will continue to face many significant challenges associated with environmental insecurity.

Although Nigeria has a strong and diverse economy relative to other countries in Sub-Saharan Africa, significant portions of its population and economy are tied to activities that are environment sensitive. Nonetheless, the fact that communities within the country have survived till today, in spite her fast population growth rate is an indication that indigenous knowledge among some groups, tribes, ethnics, clans particularly in the rural areas are being used as form coping and adaptation mechanisms (Eyong et al., 2007; NEWSAN 2013). It is important to note that indigenous knowledge about how the local people have coped with previous past environmental extremes e.g. flood, drought, water stress has the potentials of providing important guide for addressing current and future environmental threats.

Addressing sustainable development challenges in Nigeria

Nigeria recognizes that it faces many challenges in moving its economy to a more environmentally friendly, green and sustainable path (FGN, 2012a). The economic, social and environment pillars of sustainable development have been adequately embedded in many parts of the country's 1999 Constitution. In particular, the Constitution states that the Federal Republic of Nigeria is *"a State based on the principles of democracy and social justice"*. The Constitution also promises to all Nigerian citizens' justice encompassing the social, economic, political, equality of status opportunity and the dignity of the individual. With particular emphasis on the environmental pillar of sustainable development, Article 20 (sub-section 2), of the Constitution

states that, *"the State shall protect and improve the environment and safeguard the water, air and land, forest and wild life of Nigeria"*.

Nigeria's environment is currently under increasing threat from natural and human-induced disasters such as drought, floods and erosion. Population increase is exerting pressure on the environment. Rapid deforestation, resulting from unsustainable uses of forest resources for human survival (e.g. fuel wood and energy, housing etc.) is a major contributing factor to land degradation. Also, indiscriminate and inappropriate mining activities in many parts of Nigeria have left some areas of the country bare and unproductive. There is also some concern about air and water pollution, liquid and solid wastes associated with continued urbanization and industrialization in the country (FGN, 2012a). All these are threats to environmental security in the country.

A strategic vision is necessary to ensure that policies that governments will implement are the most appropriate from an economic efficiency, environmental integrity and social equity point of view, as well as coherent both at a national and an international level (OECD, 2011). The Federal Government of Nigeria envisions a large, strong, diversified, sustainable and competitive economy that effectively harnesses the talents and energies of its people and responsibly exploits its natural endowments to guarantee a high standard of living and quality of life to its citizens. Several policies touching on critical areas of national development directly harp on the issue environment and sustainable development. Some of the policies include environment, water, agriculture, water and energy. These policies and programmes are briefly reviewed in this section.

Nigeria is committed to a national environmental policy that will ensure sustainable development based on proper management of the environment (FGN, 1998). This demands positive and realistic planning that balances human needs against the carrying capacity of the environment. This requires that a number of complementary policies, strategies and management approaches are put in place which should ensure, among others that environmental concerns are integrated into major economic decision- making process; environmental remediation costs are built into major development projects; economic instruments are employed in the management of natural resources and; environmentally friendly technologies are applied. This policy, in order to succeed must be built on the following sustainable development principles that the precautionary principle which holds that where there are threats of serious or irreversible damage, the lack of full scientific knowledge shall not be used as a reason for postponing cost-effective means to prevent environmental degradation.

This policy thrust is based on fundamental re-thinking and a clearer appreciation of the interdependent linkages among development processes, environmental factors as well as human and natural resources. Since development remains a national priority, it is recognized that the actions designed to increase the productivity of the society and meet the essential needs of the populace must be reconciled with environmental issues that had hitherto been neglected or not given sufficient attention.
Therefore, the goal of the National Policy on the Environment is to achieve sustainable development in Nigeria, and, in particular to: secure a quality of environment adequate for good health and well-being; conserve and use the environment and natural resources for the benefit of present and future generations; restore, maintain and enhance the ecosystems and ecological processes essential for the functioning of the biosphere to preserve biological diversity and the principle of optimum sustainable yield in the use of living natural resources and ecosystems; and raise public awareness and promote understanding of the essential linkages between the environment, resources and development, and encourage individual and community participation in environmental improvement efforts.

One of the basic thrust of Agricultural Policy is rational utilization of agricultural resources, improved protection of agricultural land resources from drought, desert encroachment, soil erosion and flood, and the general preservation of the environment for the sustainability of agricultural production while

that of energy policy is to guarantee adequate, reliable and sustainable supply of energy at appropriate costs and in an environmentally friendly manner, to the various sectors of the economy, for national development (FGN 2001.p16)

The National Water Policy of 2004 (FGN, 2004, p.9) reiterated that water quality and quantity are interdependent and shall be managed in an integrated manner, which is consistent with broader environmental management approaches. Water quality management options shall include the use of economic incentives and penalties to reduce pollution; and the possibility of irretrievable environmental degradation as a result of pollution shall be prevented.

Apart from the broader policies cited above, there are other projects and programmes in which the issue of environmental sustainability is well embedded. For instance, the Renewable Energy Project spearheaded by the Federal Ministry of Environment is meant to develop and implement strategies that will achieve a clean reliable energy supply and establish mechanism to develop the sector, based on international best practices to showcase viability for private sector participation.

The main goal of the renewable energy project is to reduce projected energy use by 20 per cent by 2020 and meet 20 per cent of the nation's electricity needs with Class 1 renewable energy sources by 2020 (FGN, 2012a). Some of the benefits that the project is expected to bring are include reduction in green house gases, address the associated problems of environmental degradation resulting from pollution, deforestation and vegetation loss and leading Africa in implementation of the climate change commitments.

The Country Report to Rio +20 (FGN 2012a) notes that, despite the various national efforts and achievements recorded by the federal government, desertification and general land degradation remain a major challenge to Nigeria's sustainable development. The problem continues to impact adversely on the natural resource base and complicate efforts to reduce the pervasive poverty. Meeting the present and future energy, water, food and other needs of the people of Nigeria, particularly in the face of severely-degraded natural resources, and pervasive poverty, represents a formidable challenge (Adeoti and Ajibade 2008, Olokesusi, 2010). In this respect, a major initiative aimed at combating desertification is the *Great Green Wall for Sahel and Sahara Project (GGWSSP)*. As reported by the FME, the GGWSSP for Nigeria is a five-year strategic action plan with the goal of improving the well-being of the affected people and reducing their vulnerability to the impact of desertification through improved use of land and other natural resources for sustainable development and support to climate-resilient infrastructure. The development objective is to combat land degradation and desertification in Nigeria to protect and restore ecosystems and essential ecosystem services that are key to reducing poverty, enhancing food security, and promoting sustainable livelihoods. The Nigerian component of the project is targeted at fighting desertification in the 11 frontline states in Nigeria (FGN, 2012b).

Furthermore, specific Agencies have been created to provide more focussed attention to some specific environmental problems. They include the *National Oil Spill Detection and Response Agency* (NOSDRA) and *National Environmental Standards and Regulations Enforcement Agency* (NESREA), which were created respectively in 2006 and 2007. NOSDRA has the mandate to implement the national oil spill contingency plan. NESREA has responsibility to enforce all environmental laws, guidelines, policies, standards and regulations in Nigeria, as well as enforce compliance with the provisions of all international agreements, protocols, conventions and treaties on the environment to which Nigeria is a signatory.

Towards addressing climate change, Nigeria has put in place institutional structures and policies for national implementation of the UNFCCC, the Kyoto Protocol and any other instruments put in place. The government is also pursuing the implementation of environmental protection and sustainable development of the Niger Delta (FGN, 2012a).

Towards the achievement of sustainable development through the tenets of green economy, there are initiatives that will enhance its global competitiveness and best practices by

promoting the elimination of environmentally harmful subsidies and replacing them with market based incentives, enforcing its environmental rules and regulations in important sectors such as agriculture, biodiversity, forestry, water resources, fisheries and renewable energy and strengthening the economic programmes by adopting the System of Environmental and Economic Accounting (SEEA) which has been prepared by the UN statistical Division. This approach will provide a free indicator of the real level and visibility of growth, income and employment.

In all these, little or no consideration has been given to the issue of indigenous knowledge which is a major flaw in the strive to achieve sustainable development in Nigeria. As revealed in previuos sections, indigenous knowledge can become useful in jointly addressing most of the environmental problems presently confronting the country.

Conclusion and policy implications for Nigeria

This paper reflects on the linkages between environmental security and indigenous knowledge and the usefulness of these for enhacing sustainable development in Nigeria.. While the importance of indigenous knowledge has been realized by research scientists and traditional environmentalists for sustainable development, projects implementations and management in all parts of the country, it is worrisome to observe that little or no significant efforts has been initiated to incorporate this into formal environmental policy and decision making processes. In this regard, national policies have failed to sustainably address environmental security issues particularly on the living conditions of the poorest rural communities.

However, it is worth noting and acknowledged as revealed in Nigeria's position document for the year 2012 World Summit on Sustainable Development (Rio 20+) that the country will continue to pursue policies and measures to promote a more environmentally sound economy in the context of sustainable development. Such policies and measures will be based on the following key principles and approaches that recognize the economic and social values of environmental resources; conserving resources and restoring damaged environments and ecosystems; setting up targets and standards to control environmental degradation; and enabling prices to better reflect their environmental value, while ensuring access to basic goods and services (FGN, 2012).

In conclusion, on one hand, indigenous knowledge can play crucial roles in the formulation and implementation of sustainable development policies, and projects Nigeria while on the other hand, sustainable development is a key aspect of the condition of environmental security and in Nigeria, should be promoted through a variety of mechanisms including indigenous knowledge. Policy makers often mistakenly formulate policies for conserving and restoring the environment by ignoring the local people's skills and traditional conservation techniques. But the fact remains that these traditional experts posses more valuable indigenous wisdom to manage their environment in effective ways. To promote environmental security for sustainable development, indigenous knowledge should be included in all local, state and national development actions, plans and discussions.. It is therefore important for government, non-state actors and environmental stakeholders to promote the effectiveness of indigenous knowledge to promote prtactices and policies that will enhance environmental security and by extension sustainable development. The implication of all this is that a paradigm shift is required, whereby indigenous knowledge drives our development efforts in Nigeria.

References

Adeoti, John, O. and L.A. Ajibade (2008). "The Role of Government in Climate Change Adaptation in Nigeria", In: Tunji Akande and A. Kumuyi (eds.), *Challenge s of Climate for Nigeria: A Multidisciplinary Perspective*, Nigerian Institute of Social and Economic Research (NISER), Ibadan/New World Press, Ibadan, Nigeria, pp. 111-124.

Chadwick M., J. Soussan, D. Mallick and S. Alam (1996): Understanding Indigenous Knowledge: Its Role and Potential in Water Resource Management in Bangladesh

Chuvieco, E. (2012). Religious approaches to water management and environmental conservation. *Water Policy* 14(Supplement 1).

Crate S. (2011) Climate and Culture: Anthropology in the Era of Contemporary Climate Change. *Annual Review of Anthropology*. 40: pp.175–194.

Falkenmark, M. and Folke, C. (2002): The ethics of socio-ecohydrological catchment management: towards hydrosolidarity. *Hydrology and Earth System Sciences* 6(1), 1–9.

Falkenmark, M. and Rockström, J. (2004). Balancing Water for Humans and Nature: The New Approach in Ecohydrology.Earthscan, London, UK.

Federal Government of Nigeria (1998) "National Policy on the Environment". Federal Environmental Protection Agency, Abuja

Federal Government of Nigeria (2001) "National Agriculture Policy". Federal Ministry of Agriculture and Water Resources, Abuja

Federal Government of Nigeria (2003) "National Energy Policy". Energy Commission of Nigeria, Abuja

Federal Government of Nigeria (2004) "National Water Policy". Federal Ministry of Agriculture and Water Resources, Abuja

Federal Government of Nigeria (FGN) (2012a). *Nigeria's Path to Sustainable Development through Green Economy*, Country Report to the Rio+20 Summit, June.

FGN (2012b) "Great Green Wall For The Sahara and Sahel Initiative: National Strategic Action Plan", Ministry of Environment, Abuja.

Galván, M. J. (2012). Insights of the Christian Anthropology for a water-related technoethics. *Water Policy* 14(Supplement 1).

James Kamara (2013) Indigenous knowledge in natural disaster reduction in Africa.The environment Times, Poverty Times, No 3, p.4

Khagram, S and S.Ali (2006): Environment and Security, *Annu. Rev. Environ. Resour*. 2006. 31:14.1–14.17 doi: 10.1146/annurev.energy.31.042605.134901

Levin, S. (1999). Fragile Dominion: Complexity and the Commons. Perseus Books, Reading, MA.

Llamas, M. R. (2010). Foreword. In: Re-Thinking Water and Food Security. Martínez-Cortina, L., Garrido, A. & López-Gunn, E. (eds). Taylor & Francis, London.

Lopez-Gunn, E., L. De Stefano and M. R.Llamas (2012): The role of ethics in water and food security: balancing utilitarian and intangible values. *Water Policy* 14 (2012) 89–105

Mason, S. A. and A. Muller (2008): Linking Environment and Conflict Prevention: The Role of the United Nations. Report Summary, Center For Security Studies (CSS), ETH Zurich

Mathews, J. (1989). Re-defining Security. *Foreign Affairs* 68(2), 162. –177

Millennium Ecosystem Assessment (MEA) (2005). *Ecosystems and Human Well-Being: Synthesis*; Island Press: Washington, DC, USA, 2005; p. 155.

Millennium Ecosystem Assessment (MEA) (2005). Synthesis Report. United Nations, New York, NY.

Munang, R., Thiaw, T. & Rivington, I. M. (2011). Ecosystem management: tomorrow's approach to enhancing food security under a changing climate. (7), 937–954.

Nakashima DJ, Galloway McLean K, Thulstrup HD, Ramos Castillo A and Rubis JT. (2012) *Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation.* Paris: The United Nations Educational, Scientific and Cultural Organization.

National Bureau of Statistics (NBS) (2012). *Annual Abstract of Statistics: 2012*, NBC, Abuja.

National Planning Commission (2012) *Performance Report of the Nigerian Economy*, NPC, Abuja.

NEWSAN (2013): Indigenous Coping and Adaptation Knowledge to the Impacts of Climate Change in Nigeria, Society for Water and Sanitation (NEWSAN), Abuja, Nigeria. A Project of African Network on Water (ANEW) Supported By Department for International Development (DFID)

Nyong, A., Adesina, F. and Osman Elasha, B. 2007. The value of indigenous knowledge in climate change mitigation and adaptation strategies in the African Sahel. *Mitigation and Adaptation Strategies for Global Change*, 12(5): 787–97.

OECD (2011), *Towards Green Growth: Monitoring Progress*, Organisation of European Cooperation and Development (OECD), Paris.

Olokesusi, F. and Olorunfemi, F.B. (2006) "Noise Pollution" In: Matt F. Ivbijaro, F. Akintola and R.V Okechukwu (Eds) *Sustainable Environmental Management in Nigeria*. Published by Mattivi Production, Ibadan, Nigeria. Pp. 139-146.

Olokesusi, Femi and Daniel Gwary (2010) Tunji S. Akande and J. Kumuyi (2010). "Sustainable Development and Environment", In: Nigeria At 50, NISER, Ibadan, pp. 427 – 478.

Olorunfemi, F.B and Onwuemele, A. (2011) "Climate Change Vulnerability and Disaster Risk: Implications for Human Security in the Niger Delta" In: Salami, A.T and Orimoogunje, O.O (Eds) *Environmental Research and Challenges of Sustainable Development in Nigeria.* Obafemi Awolowo University Press, Ile-Ife. pp 262-288

Olorunfemi, F.B and Raheem U.A (2007) "Urban Development and Environmental Implications: The Challenge of Urban Sustainability in Nigeria". *Ibadan Journal of the Social Sciences.* Vol. 6 No 1 (March) pp. 69-78

Page E (2000): Theorizing the link between environmental change and security. *RECIEL* 9(1): 33-43

Rita Floyd, Richard Matthew (2013): *Environmental Security: Approaches and Issues*. Routledge, Jan 4, 2013 –political science 320 pages

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin III, F. S., Lambin, E., Lenton, T. M., Scheffer, M., Folke, C., Schellnhuber, H., Nykvist, B., De Wit, C. A., Hughes, T., van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P. K., Costanza, R., Svedin, U., Falkenmark, M., Karlberg, L., Corell, R. W., Fabry, V. J., Hansen, J., Walker, B., Liverman, D., Richardson, K., Crutzen, P. & Foley, J. (2009). Planetary boundaries: Exploring the safe operating space for humanity. *Ecology and Society* 14(2), 32.

Roncoli C, Crane T and Orlove B. (2009) "Fielding Climate Change in Cultural Anthropology". *In:* SA Crate and M Nuttall (eds.). *Anthropology and Climate Change*. California: Left Coast Press. pp. 87–115.

Roncoli C. (2006) Ethnographic and participatory approaches to research on farmers' responses to climate predictions. *Climate Research*, 33(1):pp 81-99.

Rusinga, O and R. Maposa (2010): 'Traditional religion and natural resources': A reflection on the significance of indigenous knowledge systems on the utilisation of natural resources among the Ndau People in South-eastern Zimbabwe, *Journal of Ecology and the Natural Environment* Vol. 2(9), pp. 201-206,

Scoones, I. and Thompson, J. 1994. *Beyond Farmer First: Rural People's Knowledge, Agricultural Research and Extension Practice*. London, Intermediate Technology.

Shaw, R., Y. Takeuchi N. Uy and A. Sharma (2009): Indigenous Knowledge Disaster Risk Reduction Policy Note, International Startegy for Disaster Reduction (ISDR), European Union, (EU), and *Strategies for Ecology Education, Diversity and Sustainability (*SEEDS)

Steiner, A, H. Martonakova, Z. Guziova (2003) Environmental Governance Sourcebook, UNDP Regional Bureau for Europe and the Commonwealth of Independent States, Bratislava, Slovak Republic

UNDP (1994): Human Development Report, United Nations Development Programme

United Nations Framework Convention on Climate Change (UNFCCC) (2013) " Best practices and available tools for the use of indigenous and traditional knowledge and practices for adaptation, and the application of gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation to climate change" Technical paper 2013/11. UNFCCC Secretariat. Bonn, Germany. Pp 162

UNU-IHDP and UNEP (2012). *Inclusive Wealth Report 2012.Measuring progress toward Sustainability*. Cambridge: Cambridge University Press