

Managing Climate Change In Africa: Challenges To Traditional Knowledge Systems And Human Values

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Abstract

Despite prolonged scientific research in Western Europe on the subject-matter of climate change and greenhouse emissions, a big gap in knowledge and understanding of what constitutes climate change and how to combat the phenomenon still exists in Africa. This gap creates uncertainty in the continent coupled with the tragic conclusion that Africa may be the worst hit continent in terms of the negative impact of climate change to sustainable livelihood. Climate changes will affect regional climatic processes and ecosystems in the continent. The position of this article is that a greater understanding of climate change could be enhanced and a more sustainable adaptive and combative solution evolved by an expanded knowledge, and inquiry drawn from Africa's traditional knowledge systems within the context of Sathya Sai's Education in Human Values (SSEHV, 2012). The article will use axiological and collaborative research components to make the case for a paradigm shift in the methodology and to present critical areas in which African traditional knowledge systems could complement current scientific approaches to understanding climate change in Africa.

The colloquium on climate change organized recently by the Faculty of the Social Sciences, University of Nigeria, is a welcome forum to brainstorm and share ideas on one of the most topical issues bordering mother Earth and Africa in the 21st century.

Climate Change: The Nigerian Scenario

The negative effects of climate change are already being felt all over Africa. Climate change is already having a very negative impact in Nigeria. The Nigerian scenario is symptomatic of the African environmental challenges and changes brought about by climate change in the continent (Kanu, 2011:34-36). In Nigeria, for example, disruptions in the ecosystems and ecological balance of weather conditions, over flooding, soil erosion, encroaching desertification, droughts, increasing land infertility, atmospheric dry clouds and polluted water systems have become the staple of daily life of indigenous peoples living in Bornu, Adamawa,

Aguata and the Niger Delta regions of the country. According to the recent report from a team of researchers from Building Nigeria's Response To Climate Change (BNRCC, 2011).

Climate change or global warming has become a new reality, with deleterious effects: seasonal cycles are disrupted, as are ecosystems; and agriculture, water needs and supply, and food production are all adversely affected. Global warming (climate change) also leads to sea-level rise with its attendant consequences, and includes fiercer weather, increased frequency and intensity of storms, floods, hurricanes, droughts, increased frequency of fires, poverty, malnutrition and series of health and socio-economic consequences. It has a cumulative effect on natural resources and the balance of nature. The impact of climate change can be vast. In Nigeria, this means that some stable ecosystems such as the Sahel Savanna may become

vulnerable because warming will reinforce existing patterns of water scarcity and increasing the risk of drought in Nigeria and indeed most countries in West Africa. As well, the country's aquatic ecosystems, wetlands and other habitats will create overwhelming problems for an already impoverished populace. Preliminary studies on the vulnerability of various sectors of the Nigerian economy to Climate Change were conducted by NEST. The sectors evaluated were based on seven natural and human systems identified by the IPCC, and condensed into five. They are: human settlements and health; water resources, wetlands, and freshwater ecosystems; energy, industry, commerce, and financial services; agriculture, food security, land degradation, forestry, and biodiversity; and Coastal zone and marine ecosystems (BNRCC-2011:12):.

Furthermore it is the acceptable view and evidence within the scientific community in Nigeria that climate change is a living threat:

Nigeria's climate is already changing. The Nigerian Meteorological Agency (NIMET 2008) assessed the Nigerian climate over the period 1941 to 2000 and demonstrated the following changes: Rainfall: Compared to previous periods, during the period from 1971 to 2000 the combination of late onset and early cessation shortened the length of the rainy season in most parts of the country. Between 1941 and 2000, annual rainfall decreased by 2-8 mm across most of the country, but increased by 2-4 mm in a few places (e.g. Port Harcourt). Temperature: From 1941 to 2000 there was evidence of long-term temperature increase in most parts of the country. The main ex-

ception was in the Jos area, where a slight cooling was recorded. The most significant increases were recorded in the extreme northeast, extreme northwest and extreme southwest, where average temperatures rose by 1.4-1.9oC. (BNRCC 2011:18).

CLIMATE CHANGE: Observed Negative Impacts

Climate change is not only a living reality in the lives of Nigerians, especially the indigenous peoples living in the wetlands, savannahs, the Niger Delta swamps, forests and the deserts but it has started to impact negatively upon the socio-economic programs meant for socio-economic improvements of the standards of living of the people of Nigeria. Nigeria's *Vision 20:2020* is the country's visionary and strategic program meant to bring about structural socio-economic transformation and sustainable development in the country, famed as the biggest black nation on earth. Vision 20:2020 Committee members, in their 2010 report, summarizing the impact of climate change on the country's economy, have already identified the phenomenon of climate change in Nigeria as a threat to the realization of the vision and its laudable economic goals. Accordingly it has observed that:

The potential for climate change to bring about damaging and irrecoverable effects on infrastructure, food production, and water supplies, in addition to precipitating natural resource conflicts makes it a critical challenge that must be responded to by any economy seeking sustainable growth in the years leading up to 2020. (Nigeria Vision 20:2020,2010)

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In addition, the deleterious effects on the country's gross domestic product (GDP) has been documented to support the main thread argument being canvassed in this article:

Recent estimates suggest that, in the absence of adaptation, climate change could result in a loss of between 2% and 11% of Nigeria's GDP by 2020, rising to between 6% and 30% by the year 2050. This loss is equivalent to between N15 trillion (US\$100 billion) and N69 trillion (US\$460 billion) (BNRCC, 2011).

More than socio-economic impacts, weather-related disasters have been identified in different parts of the country. Recently, to assist in the development of the NASPA-CCN, the BNRCC Project commissioned the Climate Systems Analysis Group at the University of Cape Town to develop climate scenarios for Nigeria. In the report, it was noted further that weather-related disasters have become more frequent in the past four decades and the trend continues. The nation's natural and agricultural ecosystems, including freshwater and coastal resources, are highly susceptible to the effects of climate change. These vulnerability factors make clear the urgent need to respond to the challenge of climate change in a comprehensive and systematic manner that, at the same time, addresses broader development priorities, taking account of the gender-differentiated needs and roles of the society (BNRCC, 2011).

Climate change's negative impact has been envisaged in the different national sectors with wide-ranging cost implications for the socio-economic fortunes of the country and her citizens. The Nigerian study group on climate change (BNRCC, 2011) identified six significant areas affected with escalating costs

in seven areas of Nigeria's national life. These are:

1. Agriculture (Crops and Livestock)

Changes in climate factors have significant consequences for the agricultural sector. The adverse impacts of climate change are expected to lead to production losses in the sector, compromising the attainment of the Millennium Development Goals, especially Goal One, "Eradicate Extreme Poverty and Hunger" and Goal Seven, "Ensure Environmental Stability." The range of possible climate change hazards and relevant adaptation measures are diverse and must be considered in the context of the local agro-ecological, production and socio-cultural conditions present for any particular area of Nigeria.

2. Freshwater Resources, Coastal Water Resources and Fisheries

Climate change will affect the nature and characteristics of the freshwater resources on which Nigerians depend. The impacts will vary between eco-zones, exacerbating existing problems of too much water (floods), too little water (droughts) and reduced water quality (e.g. salt water intrusion). Climate change impacts, including sea level rise and extreme weather, will also affect Nigeria's coastal and marine areas, home to 25% of the country's population and to Nigeria's economically important petroleum industry. These impacts on water resources will also affect fisheries, a main source of livelihoods and protein for riverside and coastal rural communities.

3. Forests

Nigerian forests are already under great pressures arising from increasing populations and growing economic wealth leading to greater demand for forest resources. Climate

change is expected to add to these pressures, through direct impacts of the changing climate on forest growth and development and through greater demands on forests by populations adjusting to climate change.

4. Biodiversity

Increased aridity, increased intensity and variability of rainfall, and sea level rise all have impacts on organisms, species, and habitats. Climate change can also lead to loss of livelihoods (for instance loss of agricultural productivity), leading to increased dependence on biodiversity for income. These climate change-related factors will exacerbate the impacts of existing human pressure on biodiversity. This will further diminish the ability of these natural heritage resources to continue to provide ecosystem services on which human development and survival depend. Climate change may also lead to the displacement of valuable ecosystems by invading species that are favoured by the new climate regime.

5. Health and Sanitation

A large part of Nigeria's economy is dependent on natural resources that are vulnerable to climate change impacts. When these resources are affected, the health of Nigerians can also be affected. Direct health impacts of climate change stem from extreme events such as heat waves, floods, droughts, windstorms, and wildfires. Indirect effects of climate change on health may arise from malnutrition due to reduced food production, from spread of infectious disease and food- and water-borne illness, and from increased air pollution. The impact of climate change on water resources, including reduced water availability in some areas and flooding causing contamination of water in other areas, will have a negative impact on the already poor sanitation

situation in Nigeria.

6. Human Settlements and Housing

Nigeria has experienced rapid urbanization with nearly 50% of the population now living in urban areas. Generally the condition of housing and provision of essential infrastructure are poor in both urban and rural areas, and Nigeria has an estimated shortage of 16 million housing units. Climate change will have an economic impact on housing throughout the country due to the wide range and distribution of hazards including sea level rise, increased frequency and severity of storm surges, increased flooding associated with high rainfall events, and high winds. Moreover, if climate change impacts decrease the national GDP as projected, this will in turn result in decreased available funding for the construction and renovation of housing.

Context and Background to Climate Change in Africa

Climate change is a major threat to sustainable growth and development in Africa. The challenges facing Africa in context of the climate change threat are many fold and may need restating:

1. The need to increase awareness and understanding among the indigenous population of Africa;
2. The need to recognize and appreciate that traditional African knowledge systems have an established means of enquiry, understanding, adapting and mitigating its environmental challenges known to the continent before the encroachment of colonialism on its soil;

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3. The need to integrate Africa's traditional knowledge systems and axiological components in the present public knowledge and inquiry on climate change;
4. The need for Africa to develop sustainable adaptive and combative measures that will be drawn from its traditional knowledge systems and suffused with human value components.

As could be seen from the climate change scenario and studies in Africa, with ample examples drawn from Nigeria, enough is not being done to accord recognition to Africa's traditional knowledge systems (Gbenga, 2008) in the current efforts to establish sustainable programs for enlightenment, adaptation, and mitigation of the climate change phenomenon and its negative impacts. The impression being created is that traditional Africa has no inbuilt knowledge systems about effective control and management of its environmental challenges. From public documentation research we can conclude that "Although Africa is the continent least responsible for climate change, it is particularly vulnerable to the effects, including reduced agricultural production, worsening food security, the increased incidence of both flooding and drought, spreading disease and increased rush of conflict over scarce land and water resources." ¹

Without providing the traditional context and cultural background to the climate change debate, colloquium and research it will be pretty difficult to appreciate the axiological and traditional knowledge arguments advanced by its proponents who are not comfortable that the current pro-western scientific approach to

public enlightenment, adaptation and mitigation measures are not only narrowing the scope of inquiry and research to western scientific models but that the public understanding of the phenomenon is steadily drying up since it is not being enriched with a more holistic approach. It is further argued that without the African indigenous people participating in the current climate change public discourse the real structure of traditional knowledge systems and human values known to African's may not be factored in to complement the present pro-European scientific system. Climate change and its management is not new to Africa. Actually climate adaptation and mitigation form part of the essential knowledge of African indigenous system centuries before the arrival of the white on the continent ²

Nevertheless, the western world is treating the present climate change debate and phenomenon as something alien and foreign to Africa. Africa is treated in neocolonial contempt as a continent without any traditional knowledge system capable of understanding and managing the phenomenon of its climate (Kanu, 2011:39). The knowledge of sustainable management of her environment and climate is native to the continent, forming part of its knowledge systems centuries before Western Europe came to Africa. The traditional knowledge systems of Africa (TKSA) is well contextualized within Victor Krishnan Kanu's axiological and philosophical framework of a squared relationship that makes up the African Cosmos (Kanu, 2011:28). In this squared relationship there is the value of God, man, ancestors, the land and deities. Man is at the centre of this squared universe surrounded by the human values of truth, peace, right conduct, non-violence and love. Human values, according to this Cosmo-axiological

perspective, is part of the metaphysical structure and essence of the African which makes life, the land, the environment and his knowledge systems a continuum and accounts for sustainable livelihood in Africa. In his 'The African American: search for truth and knowledge, Leonard Jeffries (1980, pp.12-13) it is the existential reality of the human values that account for the ability of the Africans to survive and sustain its environment, its land and feed its people over the ages (Kanu, 2011:40). Any knowledge system seeking to assist Africa to understand changes in its environment without incorporating these human values may not be helping the African people to understand the current debate, evolve its own indigenous public campaign, set up its adaptive and mitigation strategies. Climate change is about bringing about a change in behavior of how people use non-sustainable energy systems that increase earth's carbon emissions, leading to increased pollutions on atmospheric and environmental disruption of nature's ecosystems and balance. In effect climate change is first and foremost a metaphysical, axiological, cosmological, sociological and meteorological environmental challenge, which must have a cultural background, a value-context and integration of the people's knowledge systems.

Africa and the global Debate on Climate Change

Climate change is one of the most troubling challenges facing the 21st century because the last 12 years (1995 to 2006) rank among the 12 warmest years of global surface temperature since 1850.³ The growing evidence of links between climate change, Africa, globalization, migration, increasing poverty and conflict raise plenty of reasons for concern. Achim Steiner, Executive Director of

the U.N. Environment Program, in the article, "The Nexus of Climate Change, Migration and Security" concurs and elaborates further:

The costs and consequences of climate change on our world will define the 21st century. Even if nations across our planet were to take immediate steps to rein in carbon emissions—an unlikely prospect—a warmer climate is inevitable. As the U.N. Intergovernmental Panel on Climate Change, or IPCC, noted in 2007, human-created "warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level." As these ill effects progress they will have serious implications for Global national security interests as well as global stability—extending from the sustainability of coastal military installations to the stability of nations that lack the resources, good governance, and resiliency needed to respond to the many adverse consequences of climate change. And as these effects accelerate, the stress will impact human migration and conflict around the world (Steiner, 2011).

It is difficult to fully understand the detailed causes of migration, economic and political instability, but the growing evidence of links between climate change, migration, poverty and are more than enough reasons why it is time to start thinking about new and comprehensive answers to multifaceted crisis scenarios brought on or worsened by global climate change. Achim Steiner further argues:

The question we must continuously ask ourselves in the face of scientific complexity

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and uncertainty, but also growing evidence of climate change, is at what point precaution, common sense or prudent risk management demands action (Steiner, 2011).

Is there no way to simplify and lessen this scientific complexity by broadening the scope of study and shifting the paradigm of the method enquiry by integrating the traditional knowledge systems of Africa in climate change study and understanding? In the coming decades climate change will increasingly threaten humanity's shared interests and collective security in many parts of the world, disproportionately affecting the globe's least developed countries, most of which are domiciled in Africa. Climate change will pose challenging social, political, and strategic questions for the many different multinational, regional, national, and nonprofit organizations dedicated to improving the human condition worldwide. Organizations as different as the United Nations and its specialized agencies on climate change; others such as Amnesty International, the U.S. Agency for International Development, the World Bank, the International Rescue Committee, and the World Health Organization will all have to tackle directly the myriad effects of climate change.

The recent report from the UN Intergovernmental Panel on Climate Change (IPCC) noticed a disturbing scenario that started since 2006 till 2011:

The IPCC emissions scenario projects an increase in global mean surface air temperature relative to 1990 of about 2oC by 2100. Average sea level is expected to rise by about 50 centimetres from the present to 2100. From the various scenarios of emissions, large regions of Africa and more

particularly the Sahel and part of southern Africa and experience warming in the range of 3 to 6oc by 2100. (IPCC, 2007:7)

The above projections from the global perspective of the Intergovernmental Panel on Climate Change paint very tragic images and scenarios for Africa. It is noted also that Africa is particularly vulnerable to climate change because of "its high proportion of low-input, rain-fed agriculture compared with other regions of the developing worlds further compounded by other aggravating factors such as wide spread poverty and weak capacity" (Climate Change and Africa, 2007:7).

Until the year 2000 climate change discussions centered solely on mitigation. Prevention of long-term negative impacts on the planet's climate systems was sought through reductions in carbon emissions. The first and second assessment report of the IPCC alerted the world to the problem of the runaway greenhouse effect, pressed the world's governments in 1992 at Rio de Janeiro to agree to the United Nations Framework Convention on Climate Change (UNFCCC, GE.05-62220 (E) 200705) and led to the negotiation of the Kyoto protocol. ⁴

From focus on mitigation, world leaders have shifted global attention to adaptation to climate change as a necessary complementary measure to mitigation. It was pointed out that the poor countries especially Africa and Asia, would be more vulnerable and would need support to fully understand, participate and evolve sustainable adaptation and mitigation climate change measures that will reflect Africa's traditional knowledge systems and human values. As well argued by Ndanane T "who will have the courage and intellectual

panache to make the necessary methodological enquiry shifts in millennium western thinking and research on climate change to allow for Africa's cultural understanding and approaches to it, contained in its traditional knowledge systems?" The challenge of climate change to Africa must and can only be brought home to Africa and Africans by the application of its age-old cultural and traditional epistemology—knowledge that has accounted for its centuries old ability to manage and sustain change in the context of environmental challenges.

Climate Change and African Traditional Knowledge Systems

Professor Chinua Achebe has been able to paint an original epistemological motif with the bromide of African literature to depict the cultural existential reality that is climate change with its devastating impact on the traditional and sustainable livelihood of the Igbo Indigenous peoples before the arrival of the *whiteman* on the continent of Africa:

The year that Okonkwo took eight hundred yams from Nwakibie was the worst year in living memory. Nothing happened at the proper time; it was either too early or too late. It seemed as if the world had gone mad. In the morning he went back to his farm and saw the withering tendrils. The first rains were late and, when they came lasted only a brief moment. The blazing sun returned, more fierce than it had ever been known, and scorched all the green that had appeared with the rains. The earth burned like hot coals and roasted all the yams that had been sown. Like all good farmers, Okonkwo had begun to sow with the first rains. He had sown four hundred seeds when the rains dried

up and the heat returned. He watched the sky all day for signs of rain clouds and lay awake all night. In the morning he went back to his farm and saw the withering tendrils. He had tried to protect them from the smouldering earth by making rings of thick sisal leaves around them. But by the end of the day the sisal rings were burnt dry and grey. He changed them every day and prayed that the rain might fall in the night. But the drought continued for eight market weeks and the yams were killed. Some farmers had not planted their yams yet. They were the lazy easy going ones who always put off clearing their farms as long as they could. This year they were the wise ones. They sympathized with their neighbours with much shaking of head, but inwardly they were happy for what they took to be their foresight. Okonkwo planted what was left of his seed yams when the rains finally returned. He had one consolation. The yams he had sown before the drought were his own, the harvest of the previous year. He still had the eight hundred from Nwakibie and four hundred from his father's friend. So he would make a fresh start. But the year had gone mad. Rain fell as it had never fallen before. For days and nights together it poured down in violent torrents, and washed away the yam heaps. Trees were uprooted and deep gorges appeared everywhere. Then the rain became less violent. But it went on from day to day without a pause. The spell of sunshine which always came in the middle of the wet season did not appear. The yams put on luxuriant green leaves, but every farmer knew that without sunshine the tubers would not grow. That year the harvest was sad, like funeral and many farmers wept as they dug up the miserable and rotting yams. One man tied his cloth to a tree

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branch and hanged himself. (Achebe 1958 pp. 21-22)

Climate change is an environmental change known under the traditional way of life as a disrupting and abrupt change to the stable life systems of the people of Africa. It has also been argued with the above artistic depiction by Professor Achebe in his novel "Things Fall Apart" that, obviously demonstrates the fact that Africa has an indigenous traditional knowledge system (Kanu, 2011) that has assisted the peoples of the continent to understand and enjoy a sustainable management of its climate, environment and land in centuries before and after European colonialism. It amounts to intellectual, philosophical, axiological and cultural insincerity on the part of the present enquiry advocates to apply only western scientific methodology and to wrongly presume that Africans do not have credible traditional sustainable knowledge systems. Moreover, the numerical preponderance and domination of only the industrialized countries in all current global negotiations and discussions on climate change is in direct contradiction to the shocking emerging reality that, though the Western Europe are the "climate polluters" (Climate Change and Africa, 2007:8) they still impose their scientific knowledge system on Africa and willfully refuse to integrate African traditional knowledge systems into the current global inquiry, research and understanding of the phenomenon of climate change. This unacceptable knowledge variance fails to integrate the traditional human values native to Africa while marginalizing and excluding Africa from strategic climatic change negotiations. This marginalization of Africa even when it is the continent that will experience the greatest negative impact needs more emphasis and social elaboration. In describing indigenous peoples everywhere as "climate refugees"

(Ryser, 2010:41) supports further the claim of intellectual, social, philosophical and axiological marginalization of Africa in the current global inquiry, negotiation and research about climate change:

*Indigenous peoples around the world are being adversely affected by changing weather, draughts, floods, melting glaciers, and shifting temperatures resulting in serious health problems, environmental changes, changes in plants and wildlife, food security problems, population growth, and displacement. All of these affects are altering indigenous peoples' cultures, social and political relations; and in many instances forcing indigenous peoples into becoming "climate refugees. * * * Indigenous peoples are, and have been dramatically affected by changing climate in ways not fully apparent to people living in urban and suburban areas.*

*Marginalized out of sight indigenous populations have little political influences in sub-regional, regional and international for a where regulatory, mitigation and adaptation strategies are being discussed and negotiated. * * * Despite the limited influence indigenous peoples have on the production of gases that change climate they experience the most direct adverse effects of urban generated carbon dioxide and other green house gases that have altered the atmosphere. Where and how might indigenous peoples effect changes in internationals and state level policies on climate change while allowing political space for each indigenous nation to develop and implement its own adaptation plan. (Ryser, 2010:41-42)*

Ryser came up with the Muckleshoot experiment (2010:46) to determine whether and how indigenous peoples including Africa, could elevate the level of their understanding, research, inquiry and participation in the dialogue and negotiations with global and regional groups about climate change. Ryser argues that such participation in the global dialogue will help the search for answers to the millennium understanding of the phenomenon, but assist indigenous peoples to evolve traditional and creative ways to mitigate the adverse effects of climate change. It is obvious that the establishment of a global dialogue between Africa and the world should start with admitting current efforts by indigenous scholars to integrate indigenous knowledge systems into the existing scientific inquiry and research into the understanding of what is climate change, how it can be mitigated and adapted to by all peoples everywhere. Traditional knowledge helps the indigenous people to understand, combat, mitigate and adapt to climate change (Rie Clinger & Barkes, 2000). According to Professor Pietro Laureno, traditional knowledge provides:

... a formidable resource for ecosystems and land management at the local level. It was an extra ordinary multifunctional technique that solved the dual effects of traditional extreme climatic conditions: flooding during the heavy season on the one hand, and drying during the summer months. (Laureno, 2010)

Seminally, philosophical sociology and cultural wisdom describe traditional knowledge as the knowledge calabash that captures the cosmology with its known and unknown secrets of spiritual and environmental survival of the people in the individual context of

culture defining its unique epistemology. The International Centre For Traditional Knowledge defines traditional knowledge as a unique knowledge system, method and content, which could be described in the following manner with its unique attributes:

Traditional knowledge constitutes the ancient knowledge of humanity, the deepest layer on which our science and culture have developed, the local solutions that have allowed the creation and management of ecosystems and cultural landscapes on the entire surface of the planet. It enables the development of solutions with a low energy and resource use that are able to adapt to environmental variability and to react to emergencies and catastrophes in flexible and multifunctional ways. (ICTKD, 2012)

The African traditional knowledge system focuses on the following thematic thresholds with its methodological objectives and aims already recognized both by the World Intellectual Property Organization (WIPO) and UNESCO's Intangible Cultural Heritage unit (both Agencies of the United Nations):

1. To make an inventory of traditional knowledge and its innovative knowledge use in case studies on specific countries;
2. Study the possibilities for dissemination of traditional knowledge;
3. Study the parameters and the indicators for traditional knowledge loss and elaborate methods to combat such loss;
4. Select the successful practices and

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create a system of incentives for the implementation and dissemination of traditional knowledge and innovative technology deriving from traditional know how;

5. Consider the methods for the protection of traditional knowledge rights that can be implemented by persons, communities, disseminators and traditional technique innovators;
6. Discuss the promotion of traditional techniques through each country focal points and provide a guideline for the adoption of a national safe guard and of dissemination strategies (i.e. the Italian Ministry of Environment, following upon concerns about the integration of traditional knowledge systems into modern climatic change debates, have made arrangements to do just that with UNESCO, UNCOI) to create the International Centre for Traditional Knowledge. Traditional knowledge as obtains in Africa, constitutes ‘a core skill of widely adopted systems of strong and brilliant devices and methodologies for energy production and resource recycling, micro climate control and for the management of the earth’s soil” said Pietra Laureano. It is obvious that within African traditional knowledge system lies information, data, techniques, methodologies, and technologies that have determined the success or failure of the civilizations that have developed them. As Professor Laureano aptly observed, Traditional Knowledge is knowledge that has led to the adaptation of ancient civilizations and

“those who are capable of adapting have survived; those who haven’t have disappeared...”

Traditional knowledge contains testimonies and evidence-based methodologies for adaptation capacity and traditional techniques for climatic control. As well argued by (Kanu, 2010) these traditional methods of knowledge and epistemological foundations could be the basis for technological innovation (Laureano based upon submission made by Dyanna Riedinger & Fikret Barkes, 2000) culled from ‘Contributions of Traditional Knowledge to Understanding Climatic Change: and a collaborative research project in Sachs Harbour). It is worthy of the subject to restate five areas in which traditional knowledge may complement European scientific approaches to understanding and adapting to the current climate change debate in Africa:

1. As local scale expertise;
2. As a source of climate history and baseline data;
3. In formulating and implementing research questions and hypotheses;
4. As insight into impacts and adaptation in indigenous communities in Africa;
5. For the long-term community based participation and monitoring.

These five areas of potential convergence, according to Riedlinger & Berkes (2000) provide a conceptual framework for bridging the gap between traditional knowledge and western science in the context of climate change research, understanding, inquiry and

the search for the traditional and indigenous measures that will lead to authentic adaptation and mitigation in Africa.

Human Values, Traditional Knowledge and African Indigenous Rights

The application and integration of Traditional Knowledge to climate change research not only generates a human value research load, but also embeds the rights of indigenous peoples in all research, debates and negotiations at the local, national, regional and international levels. From 20-24 April, 2009, indigenous representatives from all over the world assembled in Anchorage, Alaska, for the Indigenous People's Global Summit on Climate Change (Anchorage Declaration, 2009) at the end of which solidarity was expressed that indigenous peoples living in areas that are most vulnerable to the impacts and root causes of climate change, reaffirmed "the unbreakable and sacred connection between land air, water oceans, wetland, sea, plants, animals and our human communities as the material and spiritual basis for our existence are deeply alarmed by the accelerating climate devastation brought about by unsustainable development; disproportionate adverse impacts on our cultures, human and environmental health human rights, well-being, traditional livelihoods, food systems and food sovereignty, local infrastructure economic viability and our very survival as indigenous people" (Anchorage Declaration, 2009).

The integration of African traditional knowledge into the present scientific and European western approach to climatic change inquiry will not only expand the scope of its understanding in Africa but will lead equally to collaborative and participating research

methodology that will deliver positive results for the globe. This is for the reason that it will increase the axiological value of the climate change research and equally lead to African indigenous peoples using the framework of the Sathya Sai Education in Human Values, which emphasizes the cultural and moral content of an ideal African attitude and behavior towards the sustainable management of the African environment (SSEHV,2012). Central to this unique educational model is the creation of noble human beings who see themselves as part of nature, the environment, the land and life (Kanu, 2011:34). Traditional knowledge adds the human values of truth, peace, right conduct, non-violence and love to the current research, inquiry and understanding to the global debate and discourse on climatic change. This will lead to the following value thresholds that will bring about attitudinal and behavioral transformation of the African in his efforts to understand and seek for solutions to the negative impacts and fallouts of climatic change in the African environment. Accordingly, one could thrash out the dialectical relationship between these five human values to the climate change challenge in African continent in the following research modules:

1. **5.1 Truth and Climate change:** Truth is one and expressed as unity of all life, unity in diversity and unity of man and his environment. This is the African reality that Western science must acknowledge: the African holistic approach to the study of his reality and environment;
2. **5.2 Peace and Climate change:** The peace, harmony and equilibrium of nature have been disrupted by man's wholesome adoption of western tech-

nologies that pollute the pure African environment. This unsustainable use of the resources of the environment is un-African and should be reversed;

3. **5.2 Right Conduct and Climate**

change: It is only by bringing back the age old right environmental behavior that respects life, nature and the environment known to our indigenous peoples and encoded in our traditional knowledge that will lead to successful understanding research and participation of African indigenous peoples leading to successful strategies and programs to combat, adapt and mitigate the scourge.

4. **5.3 Non-Violence and Climate**

change: The current global climate change regime and recourse to only western scientific methods does not respect and actually does violence to the African environment and its human values. It is not only a fact recognized in this article that western Europe caused the cataclysms of climate change which are ravaging Africa the most, but it is using knowledge systems that fail to recognize and respect the traditional knowledge systems which have helped the continent of Africa to sustain and preserve its environment and climate for centuries.

5. **5.4 Love and Climate change:**

love is the single and the most fundamental value in the African human value framework recognized under the Sathya Sai Education in Human Values (SSEHV, 2012) under which, according to Kanu (2010:91), all the

other values activate a noble, selfless and sacrificing spirit and social attitude that enables the African to live and exhibit a communal philosophy of others above self.

It is the absence of this fundamental value that leads to the kind of western kind of competition, which promotes crass selfishness, violence and destruction of nature in an unsustainable manner. The destruction of the African natural resources led to pollution of waterways, land and air, all fall out of the colonial, neocolonial rule of Africa and the abuse of western technology. It is integration of the African traditional knowledge system in the context of the present scientific approach that will reverse the destruction and the negative impacts of climate change. This knowledge system is well recognized and emphasized in the historical Anchorage Declaration of the role of indigenous peoples in promoting and participating in the current global discourse in climate change:

“Through our knowledge, spirituality, sciences, practices, experiences and relationships with our traditional lands, territories, waters, air, forests, oceans, seas other natural resources and all life, indigenous peoples have a vital role in defending and healing mother earth. The future of indigenous peoples lies in the wisdom of our elders, the restoration of the sacred position of women, the youth of today and in the generations of tomorrow (Anchorage Declaration, 2009:viii)

The integration of African traditional knowledge systems would complement the current scientific western approaches to understanding climate change in Africa; recognize

the rights of indigenous peoples as contained in articles 25-30 of the Universal Declaration of the Rights of Indigenous Peoples (UN-DRIP); leverage upon the contributions of traditional knowledge to the extent scholarship on climate change research and demonstrate the right of the African peoples to “free, prior and informed consent to any enquiry, research and knowledge initiatives in projects that concerns their environment”(Anchorage Declaration,2009).

It is heartening that the United Nations in recognition of the vital need for this integration of traditional knowledge systems, thought of a veritable “back to the future” policy when the UNESCO set up the United Nations Convention to Combat Desertification (UNCCD) which according to Laureano is:

a convention based on traditional methods being developed, capable of recording on a regional basis the best methods to combat heat, extreme climatic variations and desertification... an new international pact that will establish the guidelines to enable human kind to make use of traditional methods and allowing scientists and businesses alike to develop innovative solutions by tapping into the cultural heritage that has been handed down to us through the centuries (Laureano 2007).

Outside setting up the United Nations Center for Climate Change, governments in Africa should set up traditional knowledge centers on climate as adjuncts research boosts to their ministries of environment which should commission studies, research and field work to discover traditional knowledge systems in Africa. Ground-breaking findings of the research should be stored in a new African traditional

knowledge bank from where African indigenous scholars can carry out cutting-edge research on climate change and seek sustainable solutions that are native to Africa. This African traditional knowledge bank will also carry out climate change studies, classification of its activities, study the various cultural techniques for mitigation, combat ion and adaptation, embedding African values into the current Western European minded research methodologies. This creation will protect the rights of local indigenous communities in Africa who are the right-holders to traditional knowledge, recognizes their intellectual properties rights and gives them an intellectual niche that has juridical benefits internationally. Successful initiatives such as the new envisaged African Traditional Bank (ATB) with lead to active participation of indigenous peoples in future negotiations and will ensure the recognition, protection and defense of indigenous rights. The New Partnership for African Development (NEPAD) and the African Union (AU) can fund this project initiative to give African traditional knowledge a global pedestal and leverage at the ongoing climate change debate. This is the only way to end the problem of an outdated intellectual paradigm seeking to marginalize the squared human relations that emphasize human values and the sustainable management of our environment.

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Cite the article as:

Casimir, A. (2013). "Managing Climate Change in Africa: Challenges to Traditional Knowledge Systems and Human Values." Fourth World Journal. Spring. Vol 12 Num 1. pp. 29-44.

NOTES (Endnotes)

1. Official Report of the climate change and Africa 8th meeting of the Africa partnership forum Berlin, Germany 22-23 May, 2007, organized by APF support unit and the NEPAD), page I,
2. Victor Krishnan Kanu-Human Values Education and The Squared Relationship Between Man and Environment, TAISSE publications, Ndola, Zambia, 2008, p.38
3. 8th meeting Africa partnership Forum Berlin, Germany 22-23 May, 2007, :p.7
4. The Kyoto Protocol was negotiated in December 1997 and came into force in February 16th, 2005. The Kyoto protocol is a legally binding agreement under which signatories (only industrialized countries) will reduce their collective emissions of greenhouse gases by 5.2 percent on average over the five year period of 2008-12 compared to the level in 1990).