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PROJECTED IMPACT OF GLOBAL WARMING ON WEST AFRICA: CASE FOR REGIONAL AND TRANSNATIONAL ADAPTIVE MEASURES

NWABUEZE DOZIE EZEIFE*

INTRODUCTION

The paper explores the concept of Global Warming, the science behind it and signs of it in the region of West Africa. Then it attempts a look at how the countries of West Africa plan for life in a dramatically warmed world. It will conclude by making a case for Regional and Transnational Adaptation measures to cope with an increasingly warming and vulnerable world.

The paper is based on a review of research projects, abstracts of international conferences, regional and international literature on climate change and policies, draft strategies, policies and action plans developed by countries of the region, as well as the Economic Community of West African States (ECOWAS), African Union (AU), New Economic Partnership for Africa's Development (NEPAD) and other regional policies and schemes in response to climate change.

On account of paucity of funds, a lack of infrastructure, manpower, technical know-how and quite frankly, the absence of political will on

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the part of the leadership, countries of West Africa cannot, without assistance, effectively prepare to adapt to climate change. What is therefore imperative is that an approach be developed to deal with climate change on a regional level where a pooling of resources and efforts will be more impactful than a country-by-country effort.

I. WHAT IS GLOBAL WARMING?

Global warming, sometimes referred to as “climate change,” describes a phenomenon that indicates that the earth’s surface temperatures and the sub-surface ocean temperatures are rising in an uncharacteristic manner and at an alarming rate. This frightening development has been traced principally to human activities. Although there are natural occurring factors that lead to some warming of the earth’s atmosphere, the overwhelming scientific consensus is that human activities are exacerbating those events, and if unchecked, these said activities will ultimately lead to devastating consequences. With respect to West Africa, the concept of climate change and variability is defined as “significant climate modification or variation of natural or of anthropogenic origin.”¹ Ernest Asiedu Odei² defines global warming simply as the increase of the atmosphere’s temperature and its effect on the environment, including all ecosystems. He concludes that “the effects of global warming are brought about due to industrialization and other human practices, such as farming and construction.”³

Acheampong⁴ sees global warming as essentially a “measurable measure of an increase in the average temperature of the Earth’s atmosphere, oceans, rivers and landmasses.”⁵ He says that, environmental experts believe that “the Earth is currently facing a period of rapid warming brought about by rising levels of heat-trapping gas called greenhouse gases, in the atmosphere.”⁶ Tadesse⁷ looks at the definition of global warming from several angles.⁸

1. Niasse, Madiodio, Afouda, Abel and Amani, Abou (Eds), [2004] *Reducing West Africa's Vulnerability to Climate Impacts on Water Resources, Wetlands and Desertification: Elements for a Regional Strategy for Preparedness and Adaptation*, IUN, Gland, Switzerland and Cambridge, UK. Xviii+66pp.

2. Ernest Asiedu Odei, Talking Global, Published August 12, 2008 at <http://www.tigweb.org/express/panorama/article.html?ContentsID=21565>.

3. *Ibid.*

4. Acheampong, Elvis Akwasi, *Global Warming and Climate Change: Creating the Grassroots Awareness*, Feature Article published Saturday September 18, 2010 and sourced from <http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=190465>.

5. *Ibid.*

6. *Ibid.*

II. THE SCIENCE OF GLOBAL WARMING

Climate change is occurring at this rapid and destructive level because of accelerated accumulation of greenhouse gases (GHGs) in the Earth's atmosphere due principally to human activities. The Intergovernmental Panel on Climate Change (IPCC) in its 2007 Assessment⁹ on climate change confirmed that changes in atmospheric concentrations of GHGs, aerosols, land cover and solar radiation alter the energy balance of the climate system. The IPCC concluded that global GHG emissions due to human activities have grown since pre-industrial times, with an increase of 70% between 1970 and 2000;

Climate change is brought about by the destructive impact of socio-economic activities of man on the environment. Industrial and allied activities of man cause greenhouse gases such as carbon dioxide to be released into the atmosphere in great quantities. To worsen the already bad situation, deforestation under the guise of economic development has robbed the earth of plants and trees that could have to a large extent balanced off the carbon emissions.¹⁰

Acheampong¹¹ raises and answers a pertinent question:

What actually [are the] causes of global warming and climate change?

7. DEBAY TADESSE, *The impact of climate change in Africa*, ISS PAPER 220, November 2010. Culled from <http://www.issafrica.org/uploads/Paper220>.

8. "There is no internationally agreed definition of the term 'climate change', which has resulted in differences of opinion on the issue. Climate change can refer to long-term changes in average weather conditions covering all changes in the climate system, including the drivers of change, the changes themselves and their effects; or can refer only to human-induced change in the climate system." *Ibid* at page 2.

9. Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report, Summary for Policymakers*, at page 5. According to the assessment, Carbon dioxide (CO₂), is the most important anthropogenic GHG. Its annual emissions grew by about 80% between 1970 and 2004.... Global atmospheric concentrations of CO₂, methane (CH₄) and nitrous oxide (N₂O) have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from cores spanning many thousands of years. . . . Global increases in CO₂ concentrations are due primarily to fossil fuel use, with land-use change providing another significant but smaller contribution.

10. Green Revolution, *Global Warming and Africa – the Need to Create a Climate Change Adaptation Fund*, Published in the Climate Issues of Thursday November 5, 2009 available at <http://gotogreenplanet.blogspot.com/2009/11/global-warming-and-africa-need-to.html>.

11. Acheampong, Elvis Akwasi, *Global Warming and Climate Change: Creating the Grassroots Awareness*, Feature Article published Saturday September 18, 2010 and sourced from <http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=190465>.

Several gases in the atmosphere are transparent to ultraviolet and visible light but absorb infrared radiation. These gases allow sunlight to penetrate the atmosphere and be absorbed by the earth's surface. This sunlight energy is radiated as infrared radiation (commonly known as heat), which is absorbed by the greenhouse gases in the atmosphere. Because the effect is similar to what happens in a greenhouse (the glass allows light to enter but retards the loss of heat), these gases are called greenhouse gases and the warming thought to occur from their increases is called the greenhouse effect. The common greenhouse gases that form part of daily activities . . . are carbon dioxide and chlorofluorocarbons (CFCs). Carbon dioxide is the most abundant greenhouse gas. It occurs as a natural consequence of respiration. However, much larger quantities are put into the atmosphere as a waste product of energy production.¹²

III. SIGNS OF GLOBAL WARMING

Even in the face of doubt, it probably requires very little scientific research to point to very unusual weather patterns to make a case for climate change. Thus, there is scientific and anecdotal evidence of climate change in West Africa. Indeed, the recent history of West Africa has been one of increased desertification with the Sahara Desert gradually claiming the Sahel sub-region and continuing downwards towards the grass lands of West Africa. The great rivers of West Africa (the Niger, the Senegal, the Volta, and the Gambia) and Lake Chad, have lost 25% to 40% of their capacity due to evaporation and increased agriculture and domestic demands. On the opposite scale is increased flooding of West Africa with its attendant destructive forces sweeping away valuable vegetation, habitats, ecosystems, soil, infrastructure and homes, and leaving death and destruction. The years 2008 and 2009 saw floods of epic proportions sweeping the region leaving destruction estimated in the billions of dollars.

Most of the population of Africa already experiences a variety of stresses and shocks on a regular basis. In this sense, the impacts of climate change are nothing new. But the scale and, in some situations, the nature of the impacts will change dramatically as the pace of climate change increases. Greater investment in

12. *Ibid.*

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adaptation is needed now to respond to the changes that are already occurring.¹³

The increasing manifestation and heightened vulnerability of West Africa to climate change was succinctly captured by ECOWAS in the course of drafting its environmental policy. The ECOWAS Commission studied the state of the West African sub-region in relation to vulnerability and impacts of climate change, and found it true that according to the IPCC report, temperatures in West Africa have increased steadily over the years from 0.2 to 0.8 degrees, especially since 1978. The report also indicates that rainfall has decreased, particularly in the Sahel region. The reported changes have resulted in severe droughts which have affected agriculture, energy, health, eco-tourism, trade and transport. Additionally, unpredictable rainstorms and attendant floods have wreaked havoc on crops, infrastructure and human lives.

IV. WEST AFRICA'S VULNERABILITY TO CLIMATE CHANGE

West Africa lies squarely in the path of the devastating impact of climate change and the consensus is that this region will incur the greatest impact of all the African regions, and perhaps the entire world.¹⁴ According to the Humanitarian Futures Programme of King's College, London, England:

Climate change is expected to have greater impacts in West Africa than in any other populous region. Over the course of the century, mean temperatures across almost all of West Africa are predicted to rise by between 1.9% and 4.5%. The Sahel and Sahara regions are likely to see the greatest temperature increase, projected to range above 5 degrees Celsius. Best case projections foresee average temperature rises of 0.3 Celsius to 1.3 Celsius by 2030. . . . Across the region and particularly in the Northern

13. Gordon Conway [Chief Scientific Adviser], *The Science of Climate Change in Africa: Impacts and Adaptation*, February 2008, UK Department of International Development.

14. "No continent will be struck as severely by the impacts of climate change as Africa. Given its geographical position, the continent will be particularly vulnerable due to the considerably limited adaptive capacity, exacerbated by widespread poverty and the existing low levels of development. ... Consequences of this include persistence of economic, social and environmental vulnerabilities particularly for the economic and livelihood sectors. Climate change, variability and associated increased disaster risks are an additional burden to sustainable development in Africa, as well as a threat and impediment to achieving the Millennium Development Goals. Constraints in technological options, limited infrastructure, skills, information and links to markets further heighten vulnerability to climate stresses. Africa's human existence and development is under threat from the adverse impacts of climate change – its population, ecosystems and unique biodiversity will be the major victims of global climate change." FACT SHEET , *CLIMATE CHANGE IN AFRICA – WHAT IS AT STAKE?* Excerpts from IPCC reports, the Convention, & BAP. Compiled by AMCEN Secretariat.

Sahel belt, it is likely that altered temperatures and rainfall patterns will lead to changes in the epidemiological environment for both humans and animals, with some areas likely to become more susceptible to malaria, sleeping sickness and rift valley fever. Unseasonal rainfall could also lead to outbreaks of agricultural pests, including locusts and army worms. Climate change is further likely to threaten food security, as the sudden changes of temperature are likely to increase rates of desertification, which will be exacerbated by changing migration patterns and the overuse of agricultural land. It is also likely to affect fish stocks, which are becoming vulnerable to pollution and changing usage patterns. . . . These significant climate changes do not merely threaten health, water and food security, they also increase the region's vulnerability to conflict due to the displacement or migration of significant numbers of people and the likelihood of increased competition over scarce resources in some areas and a relative increase in prosperity in other parts of the region.¹⁵

Africa, and particularly West Africa, is especially vulnerable to climate change and variability on account of its socio-economic and physical characteristics that render it disproportionately susceptible to adverse impacts by climatic variations. Some of these unique characteristics include the notable contrast between wetlands and arid and semi-arid zones. Interestingly, the major West African Rivers (the Senegal, the Gambia, the Niger, and the Volta) originate in the high rainfall areas, and flow through the arid Sahel region where water is needed most. These rivers consequently flow through and are shared by multiple countries in the region. The result is that other than Cape Verde, all countries of the region share water-courses with one or more others; this has rather grave implications for those nations should there be any variation in rainfall, and thus a drop in the volume of water carried by these rivers.

Another unique characteristic of West Africa that has implications for climate change is the region's long sea front. The West African sea coast spans 15,000 kilometers, or approximately 9,320 miles. Of the 15 countries in West Africa, only four are landlocked; furthermore, approximately 40% of the region's human population lives and works within sixty kilometers of the coast. The majority of the economic, social

15. FOREWARN initiative: *Facilitating Enhanced Organizational Responsiveness for Effective West African Risk Reduction*, Published by the Humanitarian Futures Programme, King's College, London. Sourced from <http://www.daraint.org/wp-content/uploads/2012/02/FOREWARN-Initiative.pdf>.

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and political infrastructures of the 15 West African countries are concentrated close to the coast. The implication is that any significant rise in the sea level will practically wipe out the coastal urban cities together with their essential infrastructures, and all economic and farming activities on the coast lines; intrusion, inundation and coastal erosion will devastate agricultural and fishing activities on the coast and its canals and swamps; the coastal ecosystem will also take a direct hit; and lastly, the pristine beaches will be wiped out with serious implications for tourism.

The other characteristic is the region's status as the poorest in the world. Of the 49 Least Developed Countries (LDCs) worldwide, 14 are in West Africa. In other words, except Nigeria, Ghana and the Ivory Coast, all the nations of the West Africa region are on the list of the LDCs the world. West Africa is home to 14 out of the 30 countries having the lowest development index in the world. West Africa's average GDP is \$340 making it the lowest in the world. The majority of West Africa's population resides in rural areas and is heavily dependent on subsistence rain-fed agriculture. Two-thirds of West African working populations work in the agricultural sector and agriculture accounts for 30% of West Africa's GDP. Despite the region's reliance on agriculture, the potential for efficient harnessing of the region's hydro-electrical potential remains largely unexploited. West Africa has only about 110 large dams compared to China, which has over 2,000 dams.¹⁶

According to the Commonwealth Health Ministers' 2009 Update:¹⁷

Countries in the West African region are among the poorest in the world and also vulnerable to the impact of climate changes. According to the Intergovernmental Panel on Climate Change, West Africa has experienced an increase in temperature ranging between 0.20 C – 2 C between 1970 and 2004. The years 2007 and 2008 were marked in the West African region by heavy rains causing flooding in several countries in the region, reflecting the occurrence of weather extremes. Cotonou in Benin and other cities on the West African coast are increasingly being invaded by sea water as a result of an increase in sea water level. All the

16. Niassé, Madiodio, Afouda, Abel and Amani, Abou (Eds), [2004] *Reducing West Africa's Vulnerability to Climate Impacts on Water Resources, Wetlands and Desertification: Elements for a Regional Strategy for Preparedness and Adaptation*, IUN, Gland, Switzerland and Cambridge, UK. Xviii+66pp.

17. Impact of Climate Change on Health and Current Policy Responses in West Africa; www.thecommonwealth.org/files/190387/FileName/WAHO_2009.pdf.

above elements have shown that the West African region is currently suffering the effects of climate change.¹⁸

Another noteworthy matter is that West Africa's economy relies to a great extent on subsistence agriculture for its food supply, and cash crops for export; in fact, agriculture is the main employer of labor in West Africa. The impact of climate change on West African agriculture naturally would have a reverberating effect on the economies of the West African countries and on the lives of the people especially the rural population.

V. MITIGATION VERSUS ADAPTATION

The most vexing questions in the West African Climate Change policy circles are: How does West Africa respond to climate change given the paucity of funds, expertise and logistics? Should it invest in mitigation, or prepare to adapt to a warmer world? Can West Africa really do one and not the other? Are mitigation and adaptation in the context of climate change mutually exclusive concepts, or are they complementary sides of the same coin?

Mitigation of climate change has been defined as action to decrease the intensity of radiative forcing in order to reduce the effects of global warming.¹⁹ Adaptation on the other hand involves acting to tolerate the effects of global warming.²⁰ Since they can, and often overlap, it is often not a clear cut matter when one is dealing with both concepts. Climate change mitigation scenarios involve reductions in the concentrations of GHGs, either by reducing their source or by increasing their sinks.²¹

Adaptation is processes through which societies make themselves better able to cope with an uncertain future. Adapting to climate change entails taking the right measures to reduce the negative effects of climate change (or exploit the positive ones) by making the appropriate adjustments and changes....

18. *Ibid* at page 040.

19. Farber, Daniel A, *Adapting to Climate Change: Who Should Pay*, 23 FLA. ST. U.J. LAND USE & ENVTL. L. 1, 8 (2007).

20. *Ibid*.

21. Wikipedia, Climate change mitigation; http://en.wikipedia.org/wiki/Climate_change_mitigation

See also, Cole, Daniel A. "Climate Change, Adaptation, and Development", 26 UCLA J. ENVTL. L. & POL'Y 1, 3 (2008).

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Adaptation also involves learning to manage new risks and strengthening resilience in the face of change.²²

Adesina and Odekunle²³ aptly break down adaptation in the context of global warming in terms that can be grasped as follows:

Adaptability is the degree to which adjustments or modifications are possible in practices, processes, or structures of systems to anticipated or actual changes of climate. It is a measure of the resilience or resistance to negative climatic stimuli as well as the coping capacity of a community or nation. Coping capacity is usually considered as a sub-system under adaptation. It refers to the degree to which systems or practices can be adjusted or modified to respond to changing conditions. Adaptation is influenced by the quality of the resistance and resilience of a system. It is also affected by the readiness of a given system to act on the potential opportunities for adaptation. Systems that are resilient are able to return back to a steady state after a period of perturbation.²⁴

The countries of West Africa are well aware of the onslaught of the impacts of global warming and they are gearing up as much as possible to adapt. West Africa realizes that since it is not in a position to influence a mitigation of global warming and since it has little or nothing to do with causing it, it is best to stake its efforts in preparing to adapt to the impacts. That said, West African countries are not oblivious to their own responsibilities in trying to curtail conduct that contributes to global warming; thus, most of their climate change policies have the right mix of both mitigation and adaptation elements. Indeed in most instances they are interconnected given that most adaptive policies have elements that enhance mitigation efforts and vice versa.

The United Nations considering that the LDCs of world bear the brunt of the impact of global warming, while contributing very little to its causes, has tried to devise measures to address this unfairness. That is the genesis of The National Adaptation Programmes of Action (NAPA). “The National Adaptation Programmes of Action (NAPAs) provides a

22. DEBAY TADESSE, *The impact of climate change in Africa*, ISS PAPER 220, November 2010 at page 9; Culled from <http://www.issafrica.org/uploads/Paper220>.

23. Francis A. Adesina and Theophilus O. Odekunle, *Climate Change and Adaptation in Nigeria: Some Background to Nigeria's Response – III*, 2011 International Conference on Environmental and Agricultural Engineering IPCBEE vol.15(2011) ©(2011) IACSIT Press, Singapore; <http://www.ipcbee.com/vol15/26-U30024.pdf>.

24. *Ibid* at page 147.

process for LDCs to identify priority activities that respond to their urgent and immediate needs to adapt to climate change — those for which further delay would increase vulnerability and, or costs at a later stage.”²⁵ These countries are required to produce NAPAs for their individual countries. The United Nations will help fund the preparation of the NAPAs.

Under the United Nations Framework Convention on Climate Change (UNFCCC), drawing up a National Adaptation Program of Action (NAPA) is the main first step for planning adaptation at the country level. A NAPA is a document containing detailed information on a country’s potential climate change impacts, adaptation priorities, and preferred responses. Completed NAPAs are sent to the UN as a prerequisite for accessing multilateral climate change funds.”²⁶

West African countries’ response to climate change and variability has been staccato, largely uncoordinated and country-by-country. Response has been hampered by lack of funds, lack of expertise and lack of capacity. Efforts are oftentimes duplicative and often overlap, with different agencies and departments working on different aspects of climate warming related issues and subjects. There is a marked absence of coordination to eliminate waste and redundancy. The effect is that scarce resources are being wasted without recording any significant successes. The result is that the countries of West Africa have only taken a token step in addressing global warming. Their efforts are for the most part restricted to preparing country NAPAs and nothing more. No legal or infrastructural foundations have been laid to implement these NAPAs in order to address adaptation to climate change. The countries of West Africa are yet to mainstream climate change efforts to address.

West Africa faces some daunting challenges with regard to crafting, funding and implementing effective adaptive actions in the face of ever increasing climate change and variability. The challenge is further exacerbated by the fact that West African countries are far behind in making the target of the United Nations Millennium Development Goals. For countries of the West African region, working to achieve the millennium goal while battling to put the hatch down on climate change and variability is akin to walking and chewing gum at the same time; it is

25. UNFCCC; http://unfccc.int/national_reports/napas/items/2719.php.

26. Aaron Sayne, *Climate Change Adaptation and Conflict in Nigeria*, United State Institute of Peace, Special Report, June 2011, at www.usip.org.

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a double whammy. When you throw in extreme poverty, political instability and lack of capacity, the situation is seemingly hopeless.

Existing historical, social, political, economic and physical realities make a regional design and implementation of adaptive measures the only plausible option open to West African nations in their effort to confront climate change. Since the impact of climate change has no boundaries, collaboration at the regional and transnational level becomes imperative in order to fashion an effective adaptation strategy. The cost, the required logistics, the needed expertise and group dynamic calls for a regional and transnational approach to adaptation in West Africa. Urama and Ozor²⁷ put it succinctly when they argued that,

The time to act therefore is now. African countries need to face the challenge holistically through science, technology and innovation, and establish appropriate governance, policies, regulations and measures to adapt to the challenges posed by climate change especially as they affect water resources In the global arena, Africa needs to have a cohesive agenda and strategy for achieving favourable negotiations at international meetings to avoid the tragic failures experienced by African nations at the Conference of the Parties (COP 15) in Copenhagen, Denmark.... Africa as a continent of 53 nations should utilize the collaborative and partnership opportunities available with international agencies and organizations in order to respond to the multitude of complex impacts of climate change, especially on water resources.²⁸

VI. EXISTING AND PLANNED REGIONAL AND TRANSNATIONAL SCHEMES TO HELP WEST AFRICA COPE WITH CLIMATE CHANGE

ECOWAS can draw from the rich experiences of a number of existing regional and transnational organizations and schemes operating in West Africa to address some of the physical, social and economic vulnerabilities to which West Africa is exposed that will be exacerbated by climate change. The experiences of these organizations should be harnessed and their mandate expanded to include issues related to climate change. ECOWAS recognizes the primacy of regional and

27. Kevin Chika Urama and Nicholas Ozor, *IMPACTS OF CLIMATE CHANGE ON WATER RESOURCES IN AFRICA: the Role of Adaptation*, Published in December 2010 by the African Technology Policy Studies Network (ATPS) [Copy on file with Author].

28. *Ibid* at page 23.

transnational cooperative and collaborative efforts to combat and prepare to adapt to global warming.

Economic partnership and cooperation in a broader sense of the sub-region involving the river basins' organizations (OMVS, OMVG, Mano River Authority), CILSS, UEMOA, ECOWAS, etc. have gradually developed their production and sustainable natural resources management and programmes' components. The manifestation of a renewed interest and a greater synergy in environmental programmes was facilitated by the creation of a New Partnership for Africa's Development (NEPAD) and the development of its general and sub-regional environmental programme.²⁹

To underscore the importance of cooperation and collaboration in fighting climate change, ECOWAS, in its 2008 Environmental Policy document, charged the ECOWAS commission to implement the regional environment policy in close collaboration with the institutions of the member states in charge of environmental management and other national and international organizations specialized in environmental matters, particularly the West African Economic and Monetary Union (UEMOA) and Comité Inter-Etate pour la Lutte contre la Sécheresse au Sahel (CILSS).³⁰

A. CILSS

On the heels of several droughts in the Sahel section of West Africa in the 1970s, seven West African countries that abut the Sahel (the Gambia, Cape Verde, Chad, Guinea-Bissau, Burkina Faso, Mali, and Niger) teamed up with Mauritania and Chad in 1974 and CILSS. The organization was formed with the aim of pooling resources in a bid to minimize the impact of droughts in the Sahel. The CILSS has two institutions that work under its aegis: Agriculture, Hydrology, Meteorology (AGRHYMET) which is charged with the responsibility for agriculture, hydrology and meteorology, and the Sahel Institute, which specializes in the facilitation of exchange between national systems of the constituent member countries. Given the experience of these CILSS institutions, ECOWAS has signed an agreement with the CILSS to extend the activities of these two institutions to other ECOWAS member countries that are not part of the CILSS.

29. ECOWAS ENVIRONMENTAL POLICY, Published by the Environmental Directorate of the ECOWAS Commission, Abuja, Nigeria, [2008] available at www.ecowas.int.

30. See Chapter 5, Article 15 of the SUPPLEMENTARY ACT A/SA.4/12/08.

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ECOWAS has cooperated with other bodies towards achieving regional integration. This requires coordination of sub-regional programmes, an example of such cooperation resulted in the preparation of Sub-regional Action Programme to Combat Desertification in West Africa (SRAP-WA). From this experience, it is important to pursue such cooperation programmes with bodies with similar objectives in their field of technical competence.³¹

B. GWSSI

The aim of the Green Wall for the Sahara and Sahel Initiative (GWSSI)³² is to support local efforts by communities in the region in their practice of sustainable management and use of their rangelands, forests and other natural resources in dry lands. There is also the incidental target of mitigating climate change and securing the livelihoods of the native peoples of the region.³³ The initial target was to plant a line of trees running east to west through the Sahara desert in a bid to halt the expansion of the desert and resuscitate parts of the region for the greater benefit of the people who rely on the desert region. The overarching theme is to strengthen the resilience of the natural systems and the peoples of the region and thus improve the living conditions of the people.

The plan is to support the thirteen nations that border the Sahara and the Sahel,³⁴ and other foreign partners in developing national action plans and projects in individual countries as well as trans-boundary levels using a multi-stakeholder blueprint. Part of the plan is to set up a learning and networking platform to enhance the sharing of knowledge and best practices, as well, as the transfer of technology and collaborative monitoring of activities and progress among the countries in the Green Wall Initiative. The GWSSI has been praised as a step in the right

31. See page 26 of the ECOWAS ENVIRONMENTAL POLICY, Published by the Environmental Directorate of the ECOWAS Commission, Abuja, Nigeria, [2008] available at www.ecowas.int.

32. There is also the Great Green Wall Initiative which was meant to shield the Sahel region from potential Sahara desert invasions from the south. The (GWSSI) is a program initiated by thirteen nations whose boundaries border the Sahara and the Sahel, the African Union in association with European Union, the Food and Agriculture Organization and the GM-UNCCD which has the objective of tackling the detrimental social, economic and environmental impacts of land degradation and desertification in the Sahara and Sahel region of Africa.

33. See The Great Green Wall for the Sahara and the Sahel initiative: The African Wall, A publication of the AU and GGWSSI with the financial assistance of the EU. Culled from <http://www.fao.org/docrep/016/ap603e/ap603e.pdf>.

34. These are Algeria, Burkina Faso, Chad, Djibouti, Egypt, Ethiopia, the Gambia, Mali, Mauritania, Niger, Nigeria, Senegal and the Sudan.

direction in crafting a worthwhile strategy to address climate issues in Africa.

As a collective platform for the circum-Saharan countries, the Great Green Wall for the Sahel and the Sahara Initiative (GGWSSI) is a powerful tool to boost the implementation of the Rio Conventions; it is a potential catalyst for the various initiatives in the region, can strengthen regional framework for sustainable rural development, and harmonize the mobilization of resources to the benefit of the drylands.³⁵

C. CORAF/WECARD

West and Central African Council for Agricultural Research and Development (CORAF/WECARD) is an umbrella instrument for twenty-two member states of the West and Central Africa region. The CORAF/WECARD Natural Resources Management (NRM) Programme is one of eight programmes that coordinate research related to natural resources management (which includes climate change) in West and Central Africa. Taking climate change and the threat it poses for West and Central Africa into account, the CORAF/WECARD Strategic Plan states that,

Food demands from a rapidly expanding population are placing great strains on what are mostly low-input systems. This leads to degradation of natural resources in agricultural and pastoral lands, deforestation and desertification and expansion into marginal areas affecting critical environmental services such as flood and erosion control, carbon sequestration and water purification. Enhanced climatic variability due to global climate change is an additional threat.³⁶

The core principles of CORAF/WECARD climate change strategy relies, therefore, on the following schemes: linking agricultural development and food security with climate change concerns; a systems approach

35. Great Green Wall for the Sahara and the Sahel Initiative (GGWSSI): Workshop on Resource Mobilization Strategies, Sharing Knowledge and Experience in the Gambia, 09 July 2012 – 14 July 2012, Banjul, The Gambia, culled from <http://global-mechanism.org/news-events/events/great-green-wall-for-the-sahara-and-the-sahel-initiative-ggwssi-workshop-on-resource-mobilization-strategies-sharing-knowledge-and-experience-in-the-gambia>.

36. Jalloh, A., Roy-Macauley, H., Kuiseu, J. 2011. *Climate change research and development orientation framework: A CORAF/WECARD strategy for guiding climate change research and development in West and Central Africa*. Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles/West and Central African Council for Agricultural Research and Development (CORAF/WECARD). CORAF/WECARD, Dakar, Senegal.

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integrating synergies of adaptation, mitigation and sustainable food production; equity and participation of partners and beneficiaries in policy formulation and decision making processes; and consideration of gender-specific needs, as well as priorities of indigenous and vulnerable communities.³⁷

Apart from promoting the integration of climate change, CORAF/WECARD will aid climate change research through utilizing research grants and effecting projects in West and Central Africa. CORAF/WECARD also collaborates with other regional organizations, such as AGRHYMET which is a Specialized Institute within the CILSS.

D. THE AFRICAN UNION

All African countries have ratified the UNFCCC and signed the Kyoto Protocol. The AU, the umbrella organization for African countries, is also intimately involved in issues of global warming, especially as it impacts Africa, and determining how Africa might adapt to the increasing impact. The AU is also a state party to the UNFCCC and the Kyoto Protocol.³⁸ Indeed, the AU has adopted a unified negotiating position in international climate negotiations. Speaking for this African united position Debay Tadesse³⁹ says,

for the first time in history, Africa forged a common position and formed a single negotiating team empowered to negotiate and represent all the member states of the AU at the global talks that took place in December 2009 in Copenhagen.... The AUC has been given a clear mandate to forge ahead with the implementation of the climate change programme, in partnership with other strategic institutions.⁴⁰

African nations took a collective stand at the Bali climate conference and pushed for the following:

- Adequate and reliable financial support for their political measures for the adjustment to climate, i.e. a high share of the adaptation funds agreed upon in Bali;

37. *Ibid* at page 37.

38. AU (African Union), Assembly of the African Union, Thirteenth Ordinary Session, Sirte, Libya, 1-3 July 2009.

39. DEBAY TADESSE, *The impact of climate change in Africa*, ISS PAPER220, November 2010; Culled from <http://www.issafrika.org/uploads/Paper220>.

40. *Ibid* at page 9.

- More technology transfer for the mitigation and adaptation to climate change as well as – in conjunction with the G77+ China – the implementation of the principle of collective but differentiated responsibility towards the reduction commitment; and
- The right to develop, as well as global justice and a share in the global environment space.⁴¹

Debay Tardesse⁴² chronicles the efforts of the AU and its subsidiary agencies and partners to address climate change in and its impacts on Africa.

Africans have already begun to take some steps in their region. For example, the African Union Commission (AUC) supported the Environmental Initiative of the New Partnership for Africa's Development (NEPAD) and its related Action Plan, acknowledging the economic importance of climate variability and change by including a programme area on combating climate change in Africa. In addition, the AUC-supported NEPAD Africa Regional Strategy for Disaster Risk Reduction recognizes the importance of coordination across agencies for proactive disaster prevention and response strategies.

In addition, the AUC, in partnership with the UN Economic Commission for Africa and the African Development Bank, is supporting a major new initiative, the Global Climate Change Observing System-Africa Climate for Development, which began in 2007. The programme is designed to integrate climate information and services into development in support of Africa's progress towards the MDGs. A major objective is to mainstream climate information in national development programmes, focusing initially on the most climate-sensitive sectors.... African leaders are united about the need for adaptation and mitigation strategies to cope with the effects of climate change on Africa's development . . . it was decided that the ongoing climate change negotiations should give Africa an opportunity to

41. Barbara UnmuBig and Stefan Cramer, *Climate Change in Africa*, published February of 2008 in GIGA Focus Africa Edition; <http://www.za.boell.org/web/publications-431.html>.

42. DEBAY TADESSE, *The impact of climate change in Africa*, ISS PAPER 220, November 2010; Culled from <http://www.issafrica.org/uploads/Paper220>.

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demand compensation for the damage caused to its economy due to global warming.⁴³

A United Nations Economic Commission for Africa hosted a Special Session on Climate Change of the Africa Partnership Forum in Addis Ababa, Ethiopia, on 3 September 2009. The Commission recommended that both African and other development partners address climate change on the continent. Nations of Africa were advised to integrate adaptation into their development strategies, and development partners were urged to mobilize new funding and address climate change impacts in their investments. They were further encouraged to support the development of regional initiatives such as the Climate for Development in Africa (ClimDev) Programme and its Climate Policy Centre.⁴⁴

E. NEPAD

NEPAD was conceived by four African heads of State⁴⁵ in 1999 and adopted by the African Union. NEPAD is an initiative of African leaders with the objective of solving the problem of endemic underdevelopment, severe poverty and marginalization of Africa in the 21st century.⁴⁶ To complement the AU efforts in the global warming arena, the NEPAD has also become involved with climate change. In May of 2007, the NEPAD Secretariat revealed that it was about to unveil a detailed region-specific study with climate policy proposals for African Ministers of the environment.⁴⁷ NEPAD prioritizes some areas of interventions, which include combating desertification, prevention and control of invasive alien species, coastal management, global warming, building cross-border conservation areas, environmental governance, and financing.

F. CLIMATE FOR DEVELOPMENT IN AFRICA (CLIMDEV) PROGRAMME:

The Climate for Development in Africa (ClimDev) Programme is one attempt to respond to climate change and variability challenges to Africa's development. This program focuses on the area of climate sensitive sectors such as agriculture, food security, water resources,

43. *Ibid* at page 8.

44. Jalloh, A., Roy-Macauley, H., Kuiseu, J. 2011. *Climate change research and development orientation framework: A CORAF/WECARD strategy for guiding climate change research and development in West and Central Africa*. Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles/West and Central African Council for Agricultural Research and Development (CORAF/WECARD). CORAF/WECARD, Dakar, Senegal.

45. Obasanjo of Nigeria, South Africa's Mbeki, Bouteflika of Algeria and Wade of Senegal.

46. AkoAmadi, *NEPAD and the environment*, Global Ekologi October 2002 no. 4 vol. 9 http://old.ecocouncil.dk/global/english/2002_04_nepad.html.

47. *Ibid*.

energy and health. ClimDev's primary objective is to increase the climate resilience of Africa's population and address the need for improved climate information in Africa, and strengthen the use of such information for policy decision making. With ClimDev,

The objective is to provide comprehensive climate and related environmental information to policy makers, policy support organizations, and the population at large; in a format that meets the needs of each of these groups. An essential pre-requisite for this is to build a solid science and observational infrastructure upon which climate and other related environmental information can be based. ClimDev Africa will support the upgrading of observation networks and infrastructure in order to enhance the provision of essential data for climate services and early warning systems. The support also includes seasonal and long term forecasting at continental and sub-regional levels and downscaling climate projections and scenarios.⁴⁸

ClimDev also supplies expertise to African climate change and development policy-making processes at the continental, regional, national and local levels. ClimDev has recorded major achievements, including organizing the African Pavilion at the The 17th Conference of the Parties (COP17) to the UNFCCC and the 7th Session of the Conference of the Parties serving as the Meeting of the Parties (CMP7) to the Kyoto Protocol in Durban, South Africa where it held two-week side events, roundtables, and an "African Day" event. Before the Durban Conference, ClimDev held its first Climate Change and Development in Africa Conference in Addis Ababa, Ethiopia to discuss issues related to climate and development in Africa.

On the heels of these proceeding regional programs is ECOWAS. ECOWAS presents the best possible foundation for a truly regional adaptation approach for the entire West African region. The existing political, legal, infrastructural and social framework is best suited to "mainstream" any viable adaptation policy region-wide.

48. *ClimDev Africa enabling an African response to climate change*, Published by the Global Climate Alliance at <http://www.gcca.eu/intra-acp/climate-for-development-in-africa-climdev-programme>.

VII. THE ECOWAS ENVIRONMENTAL POLICY

ECOWAS is a regional organization that was formed by West African countries in 1975.⁴⁹The ECOWAS region is 5.6 million square kilometers in area and has a population of over 400 million. The official languages, which are English, French and Portuguese reflect the colonial heritages of the member nations. One of ECOWAS's objectives is promoting cooperation and integration with a view to creating a West African Economic Union along the model of the European Union. ECOWAS strives to raise the standard of living of its people, maintain and increase economic stability, strengthen relationships among member states, and contribute to the progress and development of the continent. In its treaty, ECOWAS recognizes the necessity for the harmonization and coordination of national policies, and promotion of programs, projects and activities in the area of agriculture and natural resources. ECOWAS also acknowledges the need to harmonize and coordinate policies on environmental protection. This recognition by ECOWAS nations of the need for a collective approach to environmental protection resulted in the Burkina Faso conference of 2007.

An international conference on mitigation of vulnerability to climate change in West Africa held in Burkina Faso in January 2007, agreed on the need to elaborate and implement a programme of action to mitigate West Africa's vulnerability to climate change. Under the guidance of ECOWAS, the Permanent Interstate Committee for Drought Control in the Sahel (CILSS), the Economic Commission for Africa (ECA) and the African Centre of Meteorological Application for Development (ACMAD), were instructed to elaborate the programme.

The Programme (ECOWAS, 2009), drew attention to the limited efforts in number and scope, projects inadequately financed with no strategic vision and the importance of undertaking regional activities and interventions to meet climate change. It defined a strategic vision and operational perspective for progress in adaptation. It concluded that sub-regional activities would help to ensure maximization of the allocation of resources by

49. ECOWAS is made up of the following countries of West Africa: Republic of Benin, Burkina Faso, Cape Verde, Cote d'Ivoire (Ivory Coast), the Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo.

preventing duplication of efforts and ensuring promotion of economies of scale in the sub-region.⁵⁰

The 13th Ordinary Session of Heads of State held in Abuja, Nigeria in February 2010, issued a communique. In articles 14 and 15 of their communiqué, they urged member states to prepare their national agricultural investment operational plans. The ECOWAS Commission was mandated to accelerate the adoption of the climate change adaptation plan aimed at reducing West African vulnerability.⁵¹ Recognizing the potentially catastrophic impact of climate warming on economies, peoples, infrastructure, governments and harmony in the region, ECOWAS emphasizes the imperative of setting up a regional policy to coordinate, collaborate with, and assist member states in fashioning and implementing a uniform climate change policy. Pursuant to this important function, the Secretariat drew up, and the heads of states of governments of the constituent member states ratified on 19 December 2008 in Abuja, Nigeria, a comprehensive environmental policy. ECOWAS recognizes that the region lies in the direct path of the consequences of climate change, and it must, therefore, brace for the impact.

The ECOWAS regional environmental policy was drafted in consultation with the relevant Ministries and Departments of member states and regional institutions such as the West African Economic and Monetary Union (WAEMU) and CILSS. After subjecting the draft policy to several levels of review and technical validation, it was approved on 19 December 2008 under Supplementary Act A/SA.4/12/08 by a Summit of Heads of State and Governments of the ECOWAS nations in Abuja, the capital city of Nigeria.

ECOWAS recognizes the need for a regional approach to climate change given the fact that member states have shared trans-boundary ecosystems, critical watersheds that sustain the continuous flow of big rivers in the region, extensive wildlife and migratory birds, and customary routes, or routes borne out of recent development for passage of herd, transhumance, corridors and grazing lands. A regional action is strengthened and reinforced by the following:

50. Jalloh, A., Roy-Macauley, H., Kuiseu, J. 2011. *Climate change research and development orientation framework: A CORAF/WECARD strategy for guiding climate change research and development in West and Central Africa*. Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles/West and Central African Council for Agricultural Research and Development (CORAF/WECARD). CORAF/WECARD, Dakar, Senegal, at 29.

51. *Ibid* at 30.

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- Ongoing process and progress towards political and economic integration within the sub-region and peaceful coexistence of States despite conflicts which are mostly of domestic nature;
- The progressive ease of communicating and trading across the borders within the sub-region;
- Progressive decentralization underway in the ECOWAS member states;
- The existence of common natural resources which constitutes the basis of cooperation for their sustainable management; and
- The existence of significant human resources within the ECOWAS region.⁵²

The Organization is correspondingly not oblivious of the constraints and weaknesses inherent in the region. ECOWAS recognizes in drawing up its climate change policy that:

The major constraints and weaknesses that characterize the ECOWAS region include:

- Poverty which places all the countries of the sub-region in the lowest part of the United Nations' Table of Human Development Index;
- Persistence of conflicts over the last decade;
- Unstable climatic conditions in the sub-region, including recurrent droughts and a general trend towards desertification;
- Ineffective collaboration, linkages, and coordination among institutions of environmental management; and
- Inadequate human, technological and financial capacities.⁵³

The main thrusts of the ECOWAS environmental policy are to:

- 1.) Strengthen environmental governance (setting up of a sub-regional mechanism) and building capacities to that effect;
- 2.) Promote sustainable management of resources for the improvement of sub-regional economy in an environment-friendly manner;

52. *Ibid* at 12.

53. *Ibid.*

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- 3.) Prevent environmental pollution and nuisance, urban waste and control of trans-boundary movement of hazardous waste/products; and
- 4.) Promote environmental information, education and communication for a healthy environment within the sub-region.⁵⁴

Setting up a regional economic policy is in line with Article 7 of the Supplemental Act. Article 7 sections 1(c), (d), (e) and 2(f) & (j) provides for principles of complementarities; the principle of regionality; the principle of solidarity; the principle of partnership; and the principle of capacity building respectively. In other words, Article 7 stresses the concept of shared responsibility and pooling of resources and efforts to tackle regional problems such as climate change. There still has not been a clear legal, institutional, or even practical operational framework to drive this policy, and thus the ECOWAS environmental policy remains largely all talk with no discernable substance.

VIII. WHAT MORE CAN BE DONE TO ENHANCE THE EFFECTIVENESS OF EXISTING REGIONAL AND TRANSNATIONALSCHEMES TO HELP WEST AFRICA'S ADAPTATION EFFORTS?

West Africa is beset by a multiplicity of problems that makes it difficult, if not impossible, to build a firewall against climate change and thwart its devastating impact on West Africa and its peoples. The real task is how to overcome these seemingly insurmountable odds.⁵⁵The following measures will go a long way to getting the West African region to the place it needs to be before the cresting of the ongoing climate change:

- 1) West Africa, as a block, must build a formidable unit on global climate change negotiations and force the Annex I

54. ECOWAS ENVIRONMENTAL POLICY, Published by the Environmental Directorate of the ECOWAS Commission, Abuja, Nigeria, [2008] available at www.ecowas.int, pp 5, et seq.

55. *ClimDev Africa enabling an African response to climate change*, published by the Global Climate Change Alliance at <http://www.gcca.eu/intra-acp/climate-for-development-in-africa-climdev-programme>. "Science-informed and evidence-based policy, planning and practice are essential in ensuring that development is more resilient and less vulnerable to the negative impacts of climate change and in fostering sustainable development. Some of the major challenges for the African climate community have been a critical lack of trained and experienced expertise in the fields of hydrology and meteorology, an inadequate network of stations and a very weak communication and computational capacity. From the user side, the main obstacles include lack of appropriate climate information and services, inadequate awareness about the existence of specific climate information, lack of access to specific data, lack of understanding and capacity to use climate information and a poor understanding on how to deal with scientific uncertainties."

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countries and even some Annex II and developing nations such as Russia, China, India and Brazil to contribute expertise, capacity building and funding for mitigation and adaptation efforts in West Africa. An ECOWAS negotiating team will complement the Africa Union's efforts to present a common front for the continent in international conventions and meetings on global warming issues. By so doing, the interests of the region will be better protected and the region's position will be more forcefully advocated. By banding together, member nations of West Africa will be in a position to extract more concessions from the international community and be in a better position to attract projects, program sponsorship and partnership from foreign nations, organizations, and non-governmental organizations (NGOs). As a group, member nations would be better able to source funding for adaptation projects and programs.

- 2) West African Countries as a combined unit under ECOWAS can leverage some of the available global opportunities and climate change funding to help fund not only mitigation and adaptation efforts, but also boost the economic development of West Africa. The United Nations Sponsored Reducing Emissions from Deforestation and Forest Degradation (REDD+) funding and initiatives is one such opportunity that is open to West Africa.

“REDD+ funding mechanisms and initiatives offer enormous opportunities for Africa. Engagement with REDD+ presents an opportunity to have the continent directly contribute to climate mitigation. This contribution will be tremendously significant, given that very few African countries contribute significant GHG emissions to the global carbon store. There are willing donors available, and financial mobilization is ongoing. REDD+ also offers opportunities in terms of building African capacity to adapt and mitigate climate change. In addition, if handled well, REDD+ offers opportunities for demonstration, development, diffusion and final deployment of environmentally sound technology (EST).”⁵⁶

56. Godwell Nhamo (2011): REDD+ and the global climate policy negotiating regimes: Challenges and opportunities for Africa *South African Journal of International Affairs*, 18:3, 385-406; <http://dx.doi.org/10.1080/10220461.2011.622954>.

- 3) West African countries under the auspices of ECOWAS must commit to a robust green-based development. West Africa is a region on the move and it needs to grow not on the backs of the old pollution laden technology and development strategies; it has the opportunity to grow and meet the United Nations Millennium Development Goals on new and improved green technologies. Ultimately, Africa needs sustainable development, including a rapid move toward a low-carbon economy. New green growth investment opportunities are necessary to respond to the urgent and growing need for climate change adaptation. Development that can be sustained in a world changed by climate must be enabled to build the adaptive capacity of people and define appropriate technical adaptive measures.⁵⁷
- 4) West Africa's energy needs can be filled by solar, wind and ocean resources that are in abundance. West Africans can even generate enough energy such that surpluses can be sold to other regions of Africa and Western Europe. West Africa has abundant sunlight; in many areas as much as twelve hours a day for almost 365 days a year. This is a huge renewable resource that can be harnessed to produce a substantial part of the region's energy needs. Another natural renewable source that West Africa has in abundance is wind, especially in the Sahel section of the region. There is also an abundance of wind on the coast; this free and renewable resource can be parlayed to generate electricity through thermal plants to feed the energy needs of the region by complementing it with solar generated energy. Finally, West Africa has a huge coast line that can be exploited to generate electricity from ocean waves. One commentator explains:

To attain sustainable economic development growth and to reach the Millennium Development Goals (MDGs), the potential of renewable energy (wind, water, the sun, geothermic) could also be better exploited in Africa through appropriate investments. This would be an economically interesting option, especially for the oil-importing countries of Africa, given the steady rise in oil prices on the

57. DEBAY TADESSE, *The impact of climate change in Africa*, at page 7, ISS PAPER 220, November 2010; Culled from <http://www.issafrika.org/uploads/Paper220>.

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world market. The donor community is also being asked to invest in a climate compatible future.⁵⁸

If all these renewable sources of energy are exploited, there will be no need to rely so much on firewood for energy generation and there will be less reliance on hydro-electric dams for energy generation given the anticipated reduction in volumes for the great rivers and lakes of West Africa. A reduction on West Africa's dependence on biomass for energy will result in reduction of deforestation and help mitigate climate warming. Aaron Sayne⁵⁹ believes that "Planting new trees could stabilize wetlands and coastline vulnerable to floods, cut emissions, and even creates jobs while boosting economic growth — reviving Nigeria's palm oil plantations, for instance."⁶⁰ West Africa has a lot to gain by transitioning to green trading and the green market as one commentator explains:

Developed country policies aimed at reducing greenhouse gas emissions may create new trade and investment opportunities for African LDC exporters. One of the most promising is the cultivation and refining of biofuel feedstocks, taking advantage of regulation-driven markets. The EU's Biofuel Directive, for example, is estimated to significantly raise its demand for imports of biofuels: by 2020, some 9 million tonnes of bioethanol and 1.6 tonnes of biodiesel.⁶¹

- 5) More effort should go into a regional scheme to manage and conserve fresh water sources in the region. The major rivers and lakes of West Africa, the Gambia, Volta, Senegal, and the Niger, and Lake Chad, must be better managed to sustain the region's agriculture, industrial and domestic needs. The budget and scope of the existing River Basin Authorities should be expanded and supported with adequate funding and appropriate technical capacity to assist them in

58. Barbara UnmuBig and Stefan Cramer, *Climate Change in Africa*, GIGA Focus Afrika Edition 2/2008, culled from <http://www.za.boell.org/web/publications-431.html>.

59. Aaron Sayne, *Climate Change Adaptation and Conflict in Nigeria*, United State Institute of Peace, Special Report, June 2011, at www.usip.org.

60. *Ibid* at 9.

61. Aaron Cosbey, *Competitiveness Impacts of Climate Change on LDCs' export trade*, [November 2010] trade hot topics, Issue 79 at page 4 [A Commonwealth Publication] (Supra).

managing the region's increasing loss of water. In addition, the region must embark on a transnational development of small dams on the region's rivers, lakes and flood plains to help control flooding and inundation, and at the same time, harvest and store water for use in irrigation, industrial and domestic use. Water management is perhaps the most challenging issue facing West Africa today. An efficient, well-coordinated and well managed network of dams, dykes and canals will go a long way toward saving West Africa's agriculture, guaranteeing food security and ensuring a continued supply of clean water to the peoples of West Africa.

- 6) Communication should be a key element in West Africa's efforts to adapt to climate change. The flow of critical information should be lateral and horizontal. The regional and national policy makers need to obtain crucial information from experts, as well as, from local inhabitants, who are literally on the ground of the concerned areas. Policies and plans should also flow from regional and national authorities to local communities that are directly impacted. The general public should receive crucial warnings on time to allow them to brace for any potentially catastrophic events. There are various media that can be deployed in this effort, i.e. radio, television, newspapers, the Internet and mobile telephone texts are crucial to any effective adaptation policy.⁶²
- 7) Given the contiguous borders of many West African nations, some of the national adaptation plans of action can be coordinated to run beyond individual member state boundaries. Running through the entire gamut of the member States' National Adaptation Programme of Action are these recurring decimals: how to deal with the vulnerabilities in these sectors and areas, agriculture, water, floods, drought, desertification, rising sea level and intrusion of salt water, erosion, lack of capacity, lack of funding, poverty, inadequate medical facilities and vector borne diseases.

62. DEBAY TADESSE, *The impact of climate change in Africa*, ISS PAPER 220, November 2010; Culled from <http://www.issafrica.org/uploads/Paper220>; "The mass media have a vital, but so far largely neglected, role to play in climate change issues in Africa. They can communicate with the general public and local communities, both raising awareness of climate issues generally and when specific threats arise by conveying the risks and the recommended responses. Radio is still the most effective way of reaching rural stakeholders in SSA, but new information and communication technologies should be explored as well."

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Individual nations would be hard put to confront these daunting challenges on their own. Since these problems are pervasive throughout the region and the nations lie in close proximity and share identical climate, topography, hydrology and even cultures, it makes sense for ECOWAS to fashion a formula to streamline these individual NAPAs and explore the possibility of implementation on a regional basis or at least in blocks of multinational segments. A pooling of the implementation of these NAPAs will help member nations save costs while reducing inefficiencies, redundancy, waste and duplication. The European Union is a good entity to model a truly unified West Africa after as commentators explain as follows:

A paradigm shift is required through appropriate engagement of decision makers, enabling them to analyse situations in favour of effective cooperation for the management of natural resources. Invariably, as rivers and forests transcend country borders, national decision makers need adequate orientation to be able to negotiate issues outside their immediate borders. There is a need to promote policy dialogue to enhance the formulation and implementation of appropriate transboundary policies for the efficient conservation and utilization of natural resources.⁶³

- 8) An area that is lacking in the global warming arena in West Africa is technical knowledge, funds, data collection and management, as well as an absence of meteorological and satellite weather gathering infrastructure. Given the huge cost of procuring and setting up the equipment necessary to give West Africa the technological and infrastructural foundation it needs to better predict weather patterns, it makes sense for the region to pool its resources and fund a chain of meteorological stations around the region. Perhaps commission a satellite devoted to studying and generating data for West African weather. In this technological age,

63. Jalloh, A., Roy-Macauley, H., Kuiseu, J. 2011. *Climate change research and development orientation framework: A CORAF/WECARD strategy for guiding climate change research and development in West and Central Africa*. Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles/West and Central African Council for Agricultural Research and Development (CORAF/WECARD). CORAF/WECARD, Dakar, Senegal.

West Africa can ill afford to predict and prepare for the impacts of global warming merely by literally sticking up a wet finger to determine wind direction. Thus, West Africa needs to upgrade its predictive infrastructure, and it needs a satellite in orbit to enhance data collection and communication. One commentator explains as follows:

Africa is not currently benefitting from all that climate science has to offer. Climate information, which feeds into decision making as a matter of course in developed countries, is mostly failing to reach decision makers in useful and useable forms in SSA. A computer-driven weather forecasting tool known as General Circulation Models can be used to understand current climate conditions and project future climate change. However, due to a lack of primary data on which to base the model, predicting Africa's climatic changes remains uncertain and the climate-observation system in Africa is in a far worse state than those of other continents and is deteriorating.⁶⁴

Additionally, more needs to be done in the area of training of West African climate scientists, as well as educating policy makers and indeed the entire public. Apart from acquiring the ability to gather critical data, West Africa needs climate scientists to interpret and model the raw data in order to educate policy makers and citizens of West Africa on climate warming, its impacts, and how to mitigate and adapt to it. There is a need for one or two research institutes to handle advanced research on West African climatic issues in general and global warming in particular. Technical schools and relevant departments should be opened in some of the universities in the region to train the people needed to prepare for and address global warming in West Africa. Climate change should be part of school curriculum in all the primary, secondary and tertiary institutions in member countries.

- 9) ECOWAS must set up an Agriculture Research Institute (Institute) to assist in developing crop varieties and

64. DEBAY TADESSE, *The impact of climate change in Africa*, ISS PAPER 220, November 2010 at page 7; Culled from <http://www.issafrica.org/uploads/Paper220>.

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agriculture management systems that will enhance productivity even under the adverse weather conditions of an increasingly warming world. The Institute can develop strains of cultivars that can survive the southern push of the desert and increasing droughts. The Institute can also develop stronger strains of swamp vegetation to halt coastal erosion and saline intrusion into canals and coastal aquifers. Commentators explain as follows:

Traditional knowledge applied by communities to previous climatic variations has been useful in helping them select the most appropriate adaptive and/or coping mechanisms. However, challenges posed by the emerging and anticipated changes in the climate seem to overrun indigenous knowledge and coping mechanisms for farmers. Therefore, there is a need for the development and use of appropriate technologies and best bet practices, including innovations to meet challenges like shorter growing seasons, extreme temperatures, droughts, floods, in order to enable farmers of WCA to adapt and become less vulnerable to the effects of changing climate.⁶⁵

- 10) In the minds of many around the world, Africa is synonymous with disasters. For the past four or five decades, Africa has been hit by a succession of disasters (natural and man-made) ranging from drought to famine, from floods to inundation, and from civil wars to genocidal ethnic cleansing. Reactions and responses to these recurring events have always been ad hoc, relying mainly on handouts from foreign donors and aid agencies. There has never been a concerted attempt to fashion a lasting and sustained disaster preparation and management program in place to deal with the impacts of past disaster and to handle future ones. The onset of global warming now makes it imperative that disaster preparedness and management be a main piece

65. Jalloh, A., Roy-Macauley, H., Kuiseu, J. 2011. *Climate change research and development orientation framework: A CORAF/WECARD strategy for guiding climate change research and development in West and Central Africa*. Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles/West and Central African Council for Agricultural Research and Development (CORAF/WECARD). CORAF/WECARD, Dakar, Senegal [at 37.].

of any adaptation measure. That is also the position taken by Urama and Ozor,⁶⁶ who state as follows:

From the available evidence, climate impacts which are already being felt in Africa will continue even if global warming is halted. It is imperative that disaster management becomes an integral part of the adaptation and development process. This can take the form of reducing the impacts through erecting proper infrastructure to deal with risks and disasters when they happen, and mitigating the problem among poor communities and spreading it more widely through market mechanisms such as global insurance and capital markets.⁶⁷

- 11) There must be involvement of all the players in the climate arena in fashioning any climate policy on the regional level. Member states, the private sector, farmers and other vested interests, as well as the public must weigh in and make comments and contributions to any climate policy. Fighting climate change and planning to adapt to it is a group effort that must carry along all players, from local communities to national governments, to experts and foreign partners. Commentators note the following:

By understanding what is happening to the climate, African farmers can take more proactive and informed decisions on how to act when their conditions change. The more conscious and organized the implementation of adaptation measures is, the faster new knowledge will be gained and further progress accomplished. Thus, enabling farmers to access and share information on climate change and adaptation is vital....

African governments have a natural role in sharing knowledge about climate change. While the government should provide training, it also needs to learn from the experience of its people. Climate change is a global challenge, and people

66. Kevin Chika Urama and Nicholas Ozor, *IMPACTS OF CLIMATE CHANGE ON WATER RESOURCES IN AFRICA: the Role of Adaptation*, Published in December 2010 by the African Technology Policy Studies Network (ATPS) [Copy on file with Author].

67. *Ibid* at 22.

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on the frontline of climate change need to hold their government responsible for putting adaptation strategies in place. Environmental groups have an important role to play in organizing people and bringing their opinions and experiences back to the government.⁶⁸

Serious efforts should be made to educate the public and to give early warning to the public of the onset of any major climate issue. All media should be exploited, including radio, TV, print media, Internet, cell phone texting, and community outreach.⁶⁹ A workable ECOWAS adaptation policy must draw on the rich experience of local farmers and indigenous climatologists. Without the contribution and input from local communities and players, a regional policy will not play well on the local level and there will eventually be a disconnect between the policy and those it was fashioned to help. Fatima Anafu Astanga⁷⁰ sums up the need to carry local communities along in any climate policy in the following words:

This basic indigenous knowledge on climate has been seriously ignored by policies introduced to offer solutions to the many climatic problems that occur today. However, without satisfactory participation of communities in examining the incidence of floods, droughts, gas emissions resulting from climate change, people would not be able to come out with suggestions, different analysis, interests and actions of their own. Communities sometimes tie projects related to addressing climate issues to politics. For instance, some tree planting and growing projects come along with remuneration in terms of cash and foods to enable people participate. It is very easy sometimes to put a political tag on

68. Climate Frontline, *African Communities Adapting to Survive*, November 2009, ISBN: 978-82-91923-10-9; www.preventionweb.net/english/professional/publications/v.php?id...

69. See *Integrating Climate Change Adaptation and Mitigation in Development Planning: National Policy Dialogue in Senegal*, POST DIALOGUE REPORT, Organized by ENDA "Energy, Environment, Development" Programme and START International Secretariat, Held in Dakar, Senegal at the Hotel Le Ndiambour, Prepared by Elaine Tweneboah (PhD), April 2010 [Copy is on file with Author].

70. Fatima Anafu Astanga, *Global Warming And Food Production In Rural Ghana*, A GNA feature article of August 31, 2012, culled from <http://www.ghana.gov.gh/index.php/news/features/15758-global-warming-and-food-produ...>

food or cash aid that come along with such local initiatives. Community participation in issues related to climate immensely helps them to become dynamic participants in the development of the country. This is because natural resources can only be protected when communities understand the effects of their actions on the environment and can together find solutions to them.⁷¹

- 12) ECOWAS must set up a facility for joint data collection, as well as management and sharing of information amongst member nations to streamline data flow and enhance preparedness. Such a facility will help obviate the need for member States (many do not have the means and technical know how to set up one) to have access to critical information and the data they may need to plan their responses to future disasters and climate change-induced problems.

Knowledge and access to information are essential for effective environmental management and have significant impacts on the economy and the livelihood choices people make.⁷²

Akin to good data collection and management systems is the need to cultivate and use local expertise in crafting and implementing climate change policies and adaptation measures. The tendency now is to rely on expatriate experts and foreign "African experts" at the expense of using indigenous scientists and intellectuals. The problems of West Africa can only be solved by West Africans who have firsthand knowledge of the problem and are familiar with the lay of the land. Ako Amadi decries the absence of this local content.⁷³

- 13) West Africa has a huge coastal zone that is vulnerable to global warming that which results in sea level, flooding, beach erosion, sea water intrusion, bleaching of corals and degradation of swamps and sea vegetation. A regional

71. *Ibid.*

72. DEBAY TADESSE, *The impact of climate change in Africa*, ISS PAPER 220, November 2010.

73. Ako Amadi, *NEPAD and the environment*, Global Okologi, October 2002 no. 4 vol. 9 culled from http://www.old.ecocouncil.dk/global/english/2002_nepad.html.

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coastal plan can be deployed to address these various vulnerabilities and help member nations bordering the Atlantic to have a better handle on ecological, weather, infrastructural and economic impacts that are anticipated. Such a plan should include constructing seawalls, replanting of reefs and swamp forests, and even tactical relocation away from the sea. Farmers can also be provided with seeds that thrive in saline, less mineral-rich soil.

- 14) West Africa has an abundance of forests, but they are under increasing pressures from agriculture, logging, domestic energy sourcing, urban encroachment and wildfires. West Africa can exploit these rich natural resources by better managing her forests. ECOWAS can invest in a massive reforestation program that can be used to attract foreign carbon trading credit. Reforestation will also help halt desertification, soil erosion, and sand storms as well as help sequester carbon. A proper reforestation policy will enhance not only the mitigation of global warming by acting as sinks for carbon, but it will also provide job opportunities, food and sustenance for West Africans; tourism potential; and stabilize the ecosystems of West Africa. A key element to a successful reforestation program is to build a sense of ownership in the local communities towards those forests. Consider the below comment:

The third approach is social re-engineering which is to assist local people in developing positive attitudes towards forests resources and their maintenance. When communities are made to own the forests and are encouraged to have the right attitude to the ecosystem, bush burning and careless felling of trees can be significantly reduced.⁷⁴

- 15) Migration is a phenomenon that is predicted to increase with global warming. The increasing displacement of people from their villages and towns by harsh and extreme weather patterns, as well as its negative imprint on land will see huge migrations, especially southwards. Coastal inundation, flooding and salt intrusion will cause the residents of urban

74. Francis A. Adesina and Theophilus O. Odekunle, *Climate Change and Adaptation in Nigeria: Some Background to Nigeria's Response – III*, 2011 International Conference on Environmental and Agricultural Engineering IPCBEE vol.15(2011) ©(2011) IACSIT Press, Singapore; <http://www.ipcbee.com/vol15/26-U30024.pdf>.

coastal cities and towns to make a push inland. It is critical for ECOWAS to recognize this trend and plan a regional policy for free and coordinated migration around member nations. Fortunately, there are several tribes and ethnic peoples and languages that span several nations in West Africa. These common traits and identities defy artificial national boundaries and can be the building blocks to facilitate the cross-border migration of people. ECOWAS should intensify work on the transnational ECOWAS highway that is planned for the coastal region running from Nigeria through Senegal. Several other transnational highways should also be planned to crisscross the region. There should also be an effort to plan and build a transnational ferry system to handle sea traffic through all the coastal cities and ports in West Africa.

Migration is a concept that is gaining increasing support as a key adaptation response. A well planned, coordinated and designed migration policy will help West Africa handle the increased displacement that the peoples of the region will suffer with the onset of global warming. Migration can be a good thing if the infrastructure is in place to handle it, and the people have been sensitized to accept it as a humane and moral issue. Cecilia Tacoli makes a rather strong pitch for migration as a key component of adaptation to global warming.⁷⁵

- 16) Funding is a major impediment to adaptation efforts at the local, national and regional levels. West Africa under the auspices of ECOWAS must devise a structure that allows the region as a block to source funding for adaptation projects. While fund sourcing by individual nations are often a difficult proposition, a block or regional attempt has better

75. Cecilia Tacoli, *Crisis or adaptation? Migration and climate change in a context of high mobility*, Published 2009 in *Environment and Urbanization* at <http://eau.sagepub.com/content/21/2/513>. According to her: "There is a growing evidence suggesting that mobility, in conjunction with income diversification, is an important strategy to reduce vulnerability to environmental and non-environmental risks – including economic shocks and social marginalization. In many cases, mobility not only increases resilience but also enables individuals and households to accumulate assets. As such, it will probably play an increasingly crucial role in adaptation to climate change. Policies that support and accommodate mobility and migration are important for both adaptation and the achievement of broader development goals. However, in most cases migration is still seen by many government and international agency staff as disruptive and requiring control and restrictive measures. The key argument of this paper is that what is needed urgently is a radical change in perceptions of migration and a better understanding of the role that local and national institutions need to play in making mobility be seen as part of the solution rather than the problem." At page 514.

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prospects. Participating in programs, such as the REDD+ has a better chance of success if it is done on a regional rather than on a national basis. ECOWAS, with a unified effort, can push for adaptation funding from funds such as the Global Environmental Facility; the Adaptation Fund; the Least Developed Countries Fund; and the Special Climate Change Fund. Clean Development Mechanism (CDM) is a potent source of funding for adaptation and development projects in West Africa. Most CDM investments go to places like China, India and Brazil; however, West Africa can compete and possibly attract a good number of these investments if ECOWAS demonstrates that it has the institutional capacity to handle these projects. There are some other clean technology funding and carbon trading mechanism overseas (such as the one in the State of California) that ECOWAS can vie for and benefit from. ECOWAS can collaborate with other African regional economic and political organizations to make the case that developed nations whose conduct is forcing global warming be made to pay for the cost of adapting West Africa to the impacts of global warming.

- 17) ECOWAS will do well to expedite the move to forge a full and complete economic community modeled after the European Union and thus become a United States of West Africa with a common political, economic and social structure, rather than a symbolic collection of independent states aspiring to one day form a common union. The time is now to actualize the dreams and aspirations of the founding fathers in founding the Community in 1975.

If transnational and regional organizations such as ECOWAS would implement all or a substantial number of the approaches, as has been suggested within this article, West Africa would conquer a lot of the difficulty it is having in planning and implementing worthwhile adaptation measures. Debay Tadesse⁷⁶ says that “IRI concluded that a major, continent-wide effort to integrate climate risk management into climate-sensitive development processes at all levels is an urgent and top priority requirement for Africa.”⁷⁷

76. DEBAY TADESSE, *The impact of climate change in Africa*, ISS PAPER 220, November 2010.

77. *Ibid.* at 2.

IX. CONCLUSION

West Africa must brace itself to shoulder the crushing impact of climate warming. Developed countries of the world have a moral (and some will argue, a legal) obligation to aid West Africa as it attempts to cope with climate change. The fact remains that after all is said and done, the bulk of the lifting will fall upon the shoulders of West African nations.

All hands must be on deck in the process of drawing and executing the right climate change policies and adaptation measures for the nations of West Africa. Organizations, experts, scientists, indigenous communities, government ministries and agencies, as well as foreign partners and NGOs must cooperate and collaborate in finding the right mix of solutions to climate change and in preparing West Africa to adapt to an increasingly warming world.

In the final analysis, the Abuja ratified ECOWAS climate change policy will expedite achieving the ECOWAS Environmental Policy “which aims to reverse environmental degradation and depletion of natural resources, ameliorate the quality of the living environment, conserve biological diversity, with a view to ensuring a healthy and productive environment; thereby improving the well-being of the ecosystem and the population of the sub-region.”⁷⁸ These lofty ideals, if accomplished, will blunt the impact of global warming in the region. Growth and development is not in competition with climate change efforts. They are complementary goals that can be achieved with a well-structured and cohesive policy. Dr. Johnson Boanuh [Director of the Environmental Department of the ECOWAS Commission] observes:

Climate Change is a developmental threat to major investments in all sectors of the economy, particularly agriculture and therefore requires policies that foster complementarities in science – policy – development agenda. At the same time, the challenge provides the opportunity for innovations, clean development, products development and livelihood investments. Because climate change is multifaceted, only appropriate partnerships across various layers of governance including policy, public-private-partnership, capacity and financial

78. ECOWAS ENVIRONMENTAL POLICY, Published by the Environmental Directorate of the ECOWAS Commission, Abuja, Nigeria, [2008] available at www.ecowas.int.

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investment will slow down potential threats and up-scale opportunities for development.⁷⁹

West Africa's ability to have adequate adaptation measures in place will depend to a great degree on the ability of the rest of the world to reach a workable agreement on global warming mitigation and global funding of adaptation measures for the least developed nations, which include all West African nations. Unmubig and Cramer⁸⁰ could not have put it any better. To them, the issue is not only getting the developed nations to fund mitigation and adaptation but more crucially, can the leadership of the developing nations be trusted to use the funding judiciously given their proclivity to squander and loot their nation's public funds?⁸¹

The countries of West Africa, under the aegis of ECOWAS, must integrate climate change into their development policies. Since the impact of climate change will continue to be a stumbling block in the march to achieve the United Nations Millennium Development Goals (MDGs), investment in development projects, especially those aimed at accomplishing the MDGs, must include funds to address climate change.⁸²

Climate change is hitting West Africa hard and is impacting her ability to develop and meet United Nations development goals for the region. What is needed is a collaborative and cooperative effort on the part of member nations of ECOWAS to fight this scourge. Although climate change is for the most part negatively impactful on West Africa, it

79. Dr. Johnson Boanuh, STRATEGIC SUB REGIONAL PROGRAM TO REDUCE VULNERABILITY AND ENHANCED ADAPTATION TO CLIMATE CHANGE IN WEST AFRICA, Presented at FAO/SIDA Climate Adaptation Workshop: Labedi Hotel Conference Hall 4-5 February, 2003; http://www.brural.org/IMG/pdf/3._ecowas_pasr-ao.pdf.

80. Barbara UnmuBig and Stefan Cramer, *Climate Change in Africa*, GIGA Focus Afrika Edition 2/2008, culled from <http://www.za.boell.org/web/publications-431.html>.

81. "Future negotiations will concentrate mainly on the question of whether the developed countries are ready to provide a substantial amount of funds for measures towards the mitigation of and adaptation to climate change. This will be the key issue in the post-Kyoto negotiations. On the other hand, there is the question of whether African governments are willing to make use of these new and additional funds effectively and transparently for the purpose they are meant for. Presently, there is hardly any African country which has a sufficiently transparent budgetary system; adequate checks and balances; and institutional capacities for fair commissioning, effective project monitoring, and traceable accountability." *Ibid* at page 6.

82. DEBAY TADESSE, The impact of climate change in Africa, ISS PAPER 220, November 2010 at page 12; <http://issafrica.org/uploads/Paper220>. "... African governments need to invest more in climate and meteorological information; biophysical monitoring; and early warning, preparedness and response mechanisms, and integrate such data into their planning. Climate change can offer new opportunities for productive and sustainable land management practices, such as reforestation, improved water management, integrated soil fertility management, conservation agriculture, agro forestry and improved rangeland management."

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presents opportunities for integrative growth and development if proper plans are put in place. ECOWAS should take its Abuja Initiative to the next level by “mainstreaming” it and designing the necessary legal (statutory) and infrastructural framework to take climate change into account in all its programs, operations and projects.