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BACKGROUND PAPER

ON

AFRICA AND CLIMATE CHANGE

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AU/NEPAD BACKGROUND PAPER: AFRICA AND CLIMATE CHANGE

1.1 Background

Africa accounts for 14% of the world's population, yet nine out of 10 Africans have no access to electricity, and three-quarters of their energy comes from traditional fuels. Consequently, Africa's emissions of climate change-inducing carbon dioxide are still low, estimated to be only 3.6% of the world's total. Moreover, the continent's vast forest reserves serve as a significant sink for carbon dioxide and, thus, play an important role in countering the emissions of industrialized countries. Although Africa has not historically contributed to climate change, and its forests have provided a significant sink for the carbon emitted by industrialized countries, it is predicted that the continent will be the most affected by the adverse effects of climate change, as many aspects of African economies are extremely climate sensitive.

Climate records show warming of approximately 0.7°C over most of the continent during the 20th Century, a decrease in rainfall over large portions of the Sahel, and an increase in rainfall in East and Central Africa. Climate change scenarios for Africa, based on results from several general calculation models using data collated by the Inter-governmental Panel On Climate Change (IPCC), indicate future warming across Africa ranging from 0.2°C per decade (low scenario) to more than 0.5°C per decade (high scenario). With a more rapid warming scenario, large areas of Africa would experience rainfall that significantly exceeds natural variability in the December to February and June to August periods, with resultant adverse impacts on many sectors of the economy including agriculture, infrastructure, and health, with consequent effects on economic growth and poverty reduction. This calls for urgent action and a greater preparedness for measures to mitigate the causes and impacts of climate change.

The 8th Assembly of the African Union (Assembly/AU/Dec.134 (VIII)), held in January 2007, in Addis Ababa, Ethiopia, noted that Africa's socio-economic and productive systems are extremely vulnerable to climate change. In addition, the AU acknowledged the continent's low mitigation capacities and lack of strong policy framework, highlighting the necessity of a more pro-active approach to climate change.

The AU/NEPAD Environment Action Plan, as well as African positions reached in various climate-related forums and meetings, highlight the need to have adaptation and mitigation measures as an integral part of any national programme or action plan for combating climate change. It would be beneficial for all, particularly the most vulnerable, to develop national adaptation and mitigation strategies and to integrate these into national sustainable development planning. This will entail the integration of adoption and mitigation measures into national development policy, particularly through the involvement of the economic, financial and planning agencies of the government, working in conjunction with the international donor community and private sector investors. This will also require building the requisite capacity needed for research in vulnerability and adaptation assessment within the framework of a comprehensive national, sub-regional and regional climate change strategy and in response to international efforts to design and

reach a climate change agreement. Enhanced capacity is also needed to understand and take advantage of the various financing mechanisms for climate change.

1.2 Objective:

The primary objectives of this paper are to:

- overview of the expected impacts of climate change on African economies;
- outline the African position on climate change;
- highlight, specifically, some commitments and pledges to Africa made by the G8/OECD development partners to help tackle climate change;
- review the status of implementation of previous APF/G8 commitments;
- identify actions needed to fast track and support the implementation of actions to assist African countries in addressing climate change.

This paper attempts to map out key issues and engage policy makers from a wide variety of professional and academic backgrounds using a semi-technical rather than academic style. Relevant case studies from across Africa are used to illustrate some of the key issues and possible solutions throughout the paper. Particular emphasis is given to the impacts of climate change on economic growth and poverty alleviation.

1.3.1 Overview on Climate Change

Climate change refers to a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties, persisting for an extended period - typically decades or longer - due to natural variability and/or human activity (IPCC, 2007). However, the United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods. This paper adopts the definition by IPCC since it is more comprehensive in that, even without human activities, climate change will still occur under natural variability.

1.3.2 The causes of climate change

The earth's climate is dynamic and always changing through natural cycles attributed to continental drift, volcanoes, ocean currents, the Earth's tilt, and comets and meteorites. The concern, however, is that the changes occurring today are exacerbated by human activities, leading to changes in the concentration of greenhouse gases, including water vapour, CO₂, CH₄, N₂O, and CFCs. These gases trap the infrared radiation from the Earth's surface, thus causing the greenhouse effect, a natural phenomenon that helps maintain a stable temperature and climate on Earth. Human activities through industrial activity, fossil fuel combustion, deforestation and land use changes have increased the concentration of greenhouse gases in the atmosphere. The consequent increase in infrared radiation captured in the atmosphere, is causing changes in the air temperatures, precipitation patterns, sea-levels, and the melting of glaciers.

<http://web.ceu.hu/envsci/soe/problems/climdef.htm>.

1.3.3 Possible impacts of climate change

Globally, climate change will modify risk characteristics through: (a) increased frequency and intensity of extreme climatic hazards, such as drought and flood, (b) occurrence of health hazards (such as malaria) in areas previously free from their impacts, and (c) increased vulnerability as climate-induced hazards exacerbate underlying risk conditions, such as sea-level rise. The projected changes in climate will have both negative and positive effects at the regional level, especially in key sectors of development such as water resources, agriculture, natural ecosystems and human health. The larger and faster the changes in climate, the more likely it is that adverse effects will dominate. Increasing temperatures are likely to increase the frequency and severity of weather events such as heat waves and heavy rainfall. Increasing temperatures could lead to large-scale effects such as melting of large ice sheets (with major impacts on low-lying regions throughout the world). The main expected impacts of climate change in Africa include the following (AfDB, 2002; IPCC, 2007):

- (a) Increases in drought, flood, windstorms and other extreme climate phenomena, which will reduce freshwater availability, threaten food security and human health, diminish industrial production and weaken the physical infrastructure base for socio-economic activity, resulting in reduced development;
- (b) Changes in rainfall including a likely increase in rainfall in East Africa, and drying in southeast Africa. More intense land use will result in increased deforestation, loss of forest quality, and woodlands degradation across the continent that will worsen desertification particularly in West, northern and southern Africa. This will exert greater pressure on already strained coping strategies and will very likely result in increased poverty;
- (c) Sea level rise leading to coastal erosion and flooding, particularly in West, eastern and North Africa, and bleaching of coral reefs along the Red Sea and Indian Ocean coastal zone. With more than one-quarter of the population living within 100 km of the coast and most cities concentrated along the coastline, the vulnerability to marine-induced disaster from tidal waves and storm surges will increase. For example, projections show that the combined effects of ice melting and sea water expansion from ocean warming are projected to cause the global mean sea level to rise by between 0.1 and 0.9 metres between 1990 and 2100 (Thornton *et al.*, 2006).
- (d) A decrease in river basin run-off and water availability for agriculture and hydropower generation due to changes in rainfall and river sensitivity to climate variation will likely result in increased cross-boundary tensions. This will result in more conflicts, intensification of existing conflicts, or reduced ability to resolve them.

The impacts of these changes are likely to include:

- *Loss of biodiversity.* Biodiversity is the basis of Africa's wealth. It provides consumptive resources as food, fiber, fuel, shelter, medicine, and wildlife trade; and non-consumptive functions such as stabilizing the environment and other ecosystem services. Losses in biodiversity are associated with erosion, floods, sea level rise, and the spread of invasive alien species. For example, the coral reefs in the Indian Ocean experienced massive bleaching in 1998, with over 50 percent mortality in some regions (Spalding 2001). The damage to coral reef systems has far reaching implications for fisheries, food security, tourism and overall marine biodiversity. Loss or alteration of terrestrial habitats by climate change will impact the species concentrated in the savannas and tropical forests. Already, projections of changes in climate in the twenty-first century

could alter the range of antelope species; of which 90% are concentrated in Africa (Dansenker, 2002).

Climate change is also expected to have significant impacts on animals and bird species that migrate seasonally and or annually within and outside Africa. If climatic conditions of specific habitat conditions at either end of these migratory routes change beyond the tolerance of the species involved, the species will be forced to migrate to suitable habitats or face extinction. Even where migratory species have some capacity to alter their destinations, with intense changes in land use the probability of finding sufficient suitable habitat is limited. Already such a threat is noted with the *Seventh Wonder of the World*, involving wildebeest migration between Serengeti and Maasai-Mara ecosystems in Eastern Africa.

- *Reduced agricultural production:* Increased temperatures and evaporation coupled with decreased water availability will reduce agricultural production. Approximately 70 percent of the African population lives by farming, and 40 percent of all exports are agricultural products (WRI 1996). Furthermore, one-third of the income in Africa is generated by agriculture, with crop production and livestock husbandry accounting for half or more of household income. The poorest members of society are those most dependent on agriculture for their livelihoods. As most agricultural production on the continent is rain-fed, it is highly vulnerable to changes in climate variability, seasonal shifts, and precipitation patterns.

- *Reduced fresh water availability:* Any amount of warming will result in increased water stress, especially by impacting on glaciers and water supply. The gradual yet dramatic disappearance of glaciers on Mount Kilimanjaro is a result of global warming (IPCC 2001). An estimated 82 percent of the icecap that crowned the mountain in 1912 is now gone, and recent projections note that if recession continues at the present rate, these glaciers may disappear in the next 15 years. The snow and glaciers of Mount Kilimanjaro act as a water tower, and several rivers are drying out in the warm season due to the loss of this frozen reservoir. Moreover, other glaciers on Mount Ruwenzori and Mount Kenya are under similar threat. As a result, reduced recharge of dams and ground water supply will contribute to the drying of soils, causing wind erosion, dust problems, and unaffordably high water prices for the poor.

- *Increased health problems:* Heat waves that will have serious health consequences for people who work outdoors. Changes in rainfall will also influence disease vectors for malaria and will increase susceptibility to water borne diseases such as cholera (IPCC 2001). Small changes in temperature and precipitation can boost the population of malaria-carrying mosquito. Increased flooding will also enhance breeding grounds for the malaria carriers in formerly arid areas (WWF, 2006). These problems will be exacerbated by the inability of many communities to cope with increased prevalence of the disease, thus increasing health care costs.

- *Increased migration:* Climate change impacts such as flooding, drought and desertification are displacing large populations and forcing people to leave their homes and lands in search of better livelihoods or to evade disasters. Pastoral communities have used mobility to take advantage of annual and seasonal rainfall variations. But the prolonged drying trend in the Sahel since the 1970s has demonstrated the vulnerability of such groups to climate change. They cannot simply move their axis of migration when wetter zones are already densely occupied and permanent water points fail at the drier end. The problem of droughts appears to be most severe in sub-Saharan

Africa, particularly in the Sahel and the Horn of Africa. The result has been widespread loss of human life and livestock, and substantial changes to social systems. It is estimated that about 60 million people will eventually move from the desertified areas of sub-Saharan Africa towards northern Africa and Europe by the year 2020 (UNCCD, 2006).

1.4 Why the growing focus on climate change?

There is increased awareness and evidence that climate change has the potential to undo years of progress toward meeting the millennium development goals and achieving sustainable development, while creating social, economic and environmental losses. According to the most recent report of the IPCC (2007), the cost of adaptation in Africa could be as high as 5–10% of the continent's GDP. Moreover, for every \$ 1 spent preparing for disaster, \$ 7 is spent recovering from disaster (Simms, 2005). With continuous industrial growth, if no attention is paid to the global trends, large parts of the planet may face systems collapse, endangering human existence.

Already, scientific evidence in Africa shows that climate change directly impacts on key development sectors such as water resources, land, forests, and biodiversity, tourism, and agriculture that are crucial for livelihoods, food security, and health. Africa's ability to address climate change impacts are hindered by its weak adaptive capacity due to dependence on its natural resource base, poverty among other factors. Moreover, future projections note these impacts are likely to worsen over time if action is not taken now. Thus, climate change should be addressed as a development priority by advancing sustainable development, encouraging cleaner technologies, industries and jobs, and integrating climate change risks into national policies and practices as appropriate. All these cannot be achieved single handedly: all partners and actors - governments, intergovernmental organizations, the international community, the private sector, civil society, and individuals - must join forces and work together to ensure success.

1.5 Key development sectors vulnerable to impacts of climate change

i) Ecosystems

The resilience of many ecosystems is likely to be exceeded this century by an unprecedented combination of climate change, associated disturbances (e.g. flooding, drought, wildfire, insects, and ocean acidification) and other global change drivers such as human encroachment via urbanisation, changes in land use, pollution, and overexploitation of resources. Where changes in the environment are gradual, ecosystems often re-stabilise. However, when the changes are rapid, it becomes very difficult for the ecosystems to deal with, especially those that are already highly distressed, leading to their collapse. Ecosystem collapse not only brings hardship to people who depend on them, but also create a window for invasive species, new pests and diseases. For example, the World Health Organisation (WHO) has identified 30 new diseases in the past 20 years, nearly all arising from distressed ecosystems (GBN, 2007).

In addition, an increase in mean ambient temperatures beyond 1°C has a significant influence on forest and range-land cover; species distribution, composition and migration patterns; and biome distribution. In the dry-lands, desert species are already near their tolerance limits, and some may not be able to adapt further under higher temperatures, whence the risk of extinction. Also, arid and semi-arid sub-regions and the grasslands of eastern and southern Africa are currently under threat from land degradation and desertification due to overgrazing and the creation of small cities or towns. Impact indicators include loss of biodiversity, including extinction and threatening of species, changes in vegetation composition and structure, rapid deterioration in land cover, and

depletion of water quality and quantity through the destruction of catchments and underground aquifers.

ii) Water Resources:

Of the 19 countries in the world currently classified as water-stressed, most are in Africa and this number is likely to increase, not only due to climate change, but also to non-climatic stresses such as increased demand due to population growth, degradation of watersheds caused by changes in land use, and siltation of river basins. A reduction in precipitation projected by some global climate models (GCM), especially for the Sahel and southern Africa, if accompanied by high inter-annual variability, could be detrimental to the hydrological balance of Africa, disrupting socio-economic activities that depend on water.. The IPCC (2007) projects that by 2020, between 75 and 250 million people in Africa will be exposed to increased water stress due to climate change. The variability of climates may render the management of water resources more difficult both within and between countries, resulting in conflicts. A drop in water levels in dams and rivers could adversely affect the quality of water by increasing the concentration of sewage waste and industrial effluents, thereby contributing to outbreaks of water borne diseases such as cholera. The indicators include increased water borne diseases, reduced water quality and quantity for domestic and industrial use, competition and water use conflicts and high water pricing.

iii) Agriculture and food security

Over 70 percent of rural livelihoods are dependent on agriculture; which accounts for 40% of all exports, equivalent to one-third of the national income in Africa, with the exception of oil-exporting countries (WWF, 2006). It contributes 20-30 percent of GDP in sub-Saharan Africa and 55 percent of the total value of African exports. Despite the critical role this sector plays in national economies, it is one of the most vulnerable sectors to climate change. Declines in agricultural production have resulted from unpredictable rainfall, reduced soil productivity through erosion, and increased evapotranspiration, significantly affecting food security. The WWF (2006) and IPCC (2007) project that by 2020, in some countries, yields from rain-fed agriculture could be reduced by up to 50% and that agricultural production will be severely compromised in many African countries, further compounding food insecurity and malnutrition.

In most African countries, farming depends entirely on rainfall. Increased droughts could seriously impact the availability of food, as they did in the Horn of Africa and southern Africa during the 1980s and 1990s. Climate change and desertification can cause declines in the potential productivity of land and alter fundamental socio-economic conditions, rendering people chronically vulnerable to food insecurity. Indeed, Parry *et al.* (1999) estimate that a doubling of CO₂ in this century may lead to tens of millions more at risk of food insecurity in Africa by 2080s. The major impacts of climate change on food security include changes in precipitation and insulation, changes in the length of growing seasons, changes in carbon uptake. Declines in agricultural yields, decline in the quality of pasture and livestock production, and reduced vegetation cover place local people at risk of famine.

iv) Coastal Systems

African coastal zones are already under stress from population pressure and conflicting uses adversely affected by sea-level rise associated with climate change. The coastal nations of West and Central Africa, including Senegal, Gambia, Sierra Leone, Nigeria, Cameroon, Gabon and Angola, have low-lying lagoon coasts that are susceptible to erosion, particularly countries with rapidly expanding cities on the coastal belt. The west coast often is buffeted by storm surges and extreme

storm events, which contribute to both erosion and flooding. Meanwhile, sea-level rise and climatic variation may reduce the buffer effect of coral and patch reefs along the East African coast, increasing the potential for erosion. Past studies project that a sizable proportion of the northern part of the Nile Delta will be lost through a combination of inundation and erosion, with consequent loss of agricultural land and urban areas.

v) Infrastructure

Infrastructure such as human settlement, industry, electricity and transportation are all affected by an increase in extreme weather event associated with climate change. Risks include flooding and landslides due to intense rainfall; strong winds, droughts and sea level rise. Urban areas will face increasing population pressure, as individuals living in marginal areas may be forced to migrate to cities, where infrastructure is already approaching its limits, especially for housing. Moreover, climate change could further deplete biomass energy resources as demand for energy and building materials grows. The combination of urban population pressure and decreasing water supply in catchment areas will reduce stream flow, which in turn limits hydropower production and the industrial productivity that depends on energy. Management of pollution, sanitation, waste disposal, water supply and public health, and the provision of adequate infrastructure in urban areas, will become more difficult and costly with a changing climate. The indicators include power rationing and black outs, the emergence of slums and *shantis* in urban areas, and collapsed bridges.

vi) Human Health

Africa is increasingly vulnerable to vector-borne diseases and reduced nutritional status. Increased temperatures would lead to increased precipitation thereby increasing prevalence to malaria, yellow fever, dengue fever, onchocerciasis and trypanosomiasis. Increased morbidity and mortality in sub-regions where vector-borne and respiratory diseases increase following climatic changes would have far-reaching economic consequences in terms of increased health care costs. The indicators include: weather related mortality, infectious diseases, reduced air quality and a rise in respiratory illness, human disease prevalence, high infant mortality rate, and increased health care costs.

vii) Tourism and Wildlife

Tourism, one of Africa's fastest growing industries, is heavily based on wildlife, nature reserves, coastal resorts and an abundant water supply for recreation. Projected droughts or a reduction in precipitation in the Sahel and eastern and southern Africa would affect wildlife distribution and numbers. This would lead to relocation or disappearance of flora and fauna that attract tourists, thereby reducing tourism earnings. Approximately 20-30 percent of plant and animal species assessed so far are at increased risk of extinction if global average temperature exceeds 1.5-2.5°C. The indicators/impacts include species extinction, reduced earnings from tourism, decline in the number of tourists, increased human-wildlife conflicts and massive reduction in employment opportunities.

1.6 Positive initiatives to address climate change by African countries

Given Africa's vulnerabilities to climate change, it is important for the region to engage in both mitigation and adaptation activities. African governments recognize the urgency and the need to address impacts of climate change and already have taken some initial steps at the local, national, sub-regional, regional and international levels. These initiatives include:

1.6.1 Local level

It is important to note that local initiatives focus more on adaptation strategies as a means of reducing vulnerability and enhancing resilience of local communities (OSS, 2007; Trench *et al.*, 2007). Such strategies include:

- Diversification of economic activity to provide alternative sources of income such as mixed husbandry, petty trade, fishing, casual and temporary migration;
- Modification of management of agrosilvocultural systems by combining crop and livestock production with afforestation;
- Soil and water management including rainwater harvesting, construction of stone bunds, terracing, and building of traditional wells;
- Pastoralism and mobility to maximize sparse rangeland resources, though this way of life faces crisis due to land sub-divisions;
- Herd diversification: keeping different livestock species (grazers, mixed feeders, and browsers) to reduce dependence on single feed sources;
- Patronage or social capital: traditional solidarity based on religious and traditional ethical mechanisms such as loaning animals to the poor;
- Management of marine and coastal systems through conservation and desalination activities to overcome the lack of fresh water;
- Crop and animal breeding to increase drought and disease resistance, and early maturation. Other measures include flood recession agriculture, irrigation, market gardening and greenhouse gardening;
- Drought insurance index: this involves providing private sector, index-based weather insurance directly to smallholders. Currently under pilot testing in Africa, such crop insurance provides rural households the opportunity to re-access commercial farming;
- Community based organizations (CBOs): A number of CBOs carry out initiatives that directly or indirectly combat desertification and influence climate change, such as reforestation programmes to increase carbon sinks and reduce erosion.

1.6.2 National level

a) Ratification of the UNFCCC and Kyoto Protocol

African countries have demonstrated their commitment to mitigate the impacts of climate change by ratifying the UN Framework Convention on Climate Change and the Kyoto Protocol. .

b) Early warning and monitoring systems

Monitoring systems have been put in place by several governments to reinforce early warning by providing relevant information to promote pro-active measures and preparedness. Strengthening such alert systems helps African countries and regional organizations to manage the risks related to climate change, increasing their preparedness for food shortages and other disasters. In spite of the short-term success of these programs, planned adaptation strategies for future reoccurrences are few. Governments too often wait for an emergency before taking action.. Using external emergency aid as a substitute for local preparation and response weakens instead of enhancing local adaptation capacity.

Other monitoring programmes on climate and its related impacts at regional and international levels include: USAID's Famine Early Warning System (FEWSNET); FAO's Global Information and Early Warning System (GIEWS); the WFP's Vulnerability Analysis and Mapping, (VAM);

Global Monitoring for Food Security (GMFS); Monitoring Agriculture with Remote Sensing (JRC-MARS FOOD); SADC's Regional Early Warning System for Food Security (SADC-REWU). Regional centres with a risk and vulnerability monitoring function include: the Regional Centre for Mapping Resources for Development (RCMRD); the IGAD Climate Prediction and Analysis Center (ICPAC), the OSS and AGRYMET.

c) Implementation of national action programmes

African countries through the support of development partners are at different stages in developing and implementing their National Action Programmes to combat desertification (NAPs). The NAPs provide strategies for specific land and drought-related plans and programs, and serve as important tools in guiding implementation, donor coordination and monitoring of efforts in combating desertification and poverty reduction. The Least Developed Countries are also formulating their national action programmes for adaptation (NAPA) to address the impacts of climate change.

d) Establishment of national coordinating bodies

National Coordinating Bodies (NCBs) are established in accordance with UNCCD provisions. Their role is coordination, guidance and leadership to ensure cross-sectoral and integrated planning for desertification control activities. However, the performance and effectiveness of the NCBs are constrained by the limited human, technical and financial resources.

e) Enforcement of national laws and regulations

Several governments have enforced laws that will curb illegal cutting of indigenous forests or clearing of wetlands without obtaining permits. Forests store large amounts of carbon in both trees and soils that would be released into the atmosphere, if they were cut down, burned, ploughed or dried out. Examples of such protective laws include South Africa's National Forest Act of 1998, and Kenya's forestry bill of 2004 and Environment Management Act of 1999.

f) Research and development activities

Some governments are supporting biotechnology research on the development of crops and animals that are resistant to changes in temperature, rainfall regimes, disease, and water stresses through national research institutes, as is being done in Kenya through the Kenya Agricultural Research Institutes (KARI).

1.6.3 Sub-regional and regional actions

The Sub-regional Action Programmes (SRAP) and the Regional Action Programme (RAP) on drought and desertification have been undertaken in Africa. These programmes complement the national action plans, particularly in the management of trans-boundary resources and crosscutting sub-regional issues such as information collection and dissemination, capacity building, and technology transfer. Presently, the four SRAPs being implemented under the auspices of sub-regional institutions include: the Permanent Inter-State Committee on Drought Control in the Sahel (CILSS, West Africa); the Economic Community of West African States (ECOWAS) including Chad; the Intergovernmental Authority on Development (IGAD, East Africa); the Arab Maghreb Union (AMU) for North Africa, including Egypt; and the Southern African Development Community (SADC) for southern Africa. These institutions focus on drought and the food security issues resulting from drought. However, the SRAP for central Africa is on-going under the auspices of the Central African Forest Commission (COMIFAC).

The Sub-regional environment action plans have been developed for all five sub-regions. These programmes provide a framework for environmental management in the sub-regions and compliment existing regional and national plans on environment. The plans focus on regional actions to deal with issues including drought, desertification and sustainable land management.

1.6.4 Regional programmes

- The Climate Change Adaptation in Africa (CCAA) research and capacity development program, supported by Canada's International Development Research Centre and the UK Department for International Development, aims to improve the capacity of African countries to adapt to climate change in ways that benefit the most vulnerable. Building on existing initiatives and past experience, the CCAA program works to establish a self-sustained skilled body of expertise in Africa to enhance the ability of African countries to adapt.
- The Green Wall Sahara Initiative was initiated by the African Union (AU) in collaboration with ECA, FAO, UNEP, UNCCD, CEN-SAD and OSS., It was launched in December 2006. The African Heads of State and Government in their January 2007 Summit adopted the Decision on the implementation of the initiative. The programme stretches from Mauritania to Djibouti, covering all the countries in the African Sahara region. The programme aims to slow the advance of the Sahara Desert, to enhance environmental sustainability, and control land degradation, promote integrated natural resources management, conserve biological diversity, and contribute to poverty reduction and job creation.
- The ECA-AU-AfDB initiative on land policy in Africa aims at building consensus among key players in Africa on a vision of successful land policy/land reform. It seeks agreement on a comprehensive framework and guidelines for the formulation and implementation of land policy in Africa by the end of 2008. The land policy will ensure important water catchments and natural habitats are preserved and properly managed.
- The New Partnership for Africa Development (NEPAD) Comprehensive Africa Agricultural Development Programme (CAADP) has been endorsed by African heads of state and governments as a framework for the restoration of agricultural growth, food security and rural development in Africa. Its objective is to achieve an annual agricultural growth rate of at least 6% in sub Saharan African countries by the year 2015. To reach this goal, the CAADP process and framework has a strong focus on assisting countries in allocating at least 10 percent of national budgetary resources to agriculture within the next five years. It also aims at enhancing food security by promoting programs designed to increase agricultural production, improve the nutritional value of staple foods, and ensure better access to food for vulnerable groups as well as improving land management practices.

1.6.5 International initiatives

a) National carbon emission trading

National governments participate in the international emission trading regime by acting as a host country for emission reduction projects. As at December 2007, there were 850 clean development mechanism projects in 49 developing countries, but only 2.7 percent (23) of those projects are in Africa. These projects are meant to potentially reduce annual emissions of greenhouse gases. The six CDM projects approved in South Africa, for example, will potentially reduce annual CO₂ by 244,600 tonnes, an equivalent of the annual emissions for 31,359 south Africans (EMEMD, 2007).

1.7 Climate finance

There are several financial mechanisms supporting mitigation and adaptation of climate change related activities. However, most of these finances support mitigation, which is relevant but not crucial for Africa given the continent's minor contribution to global GHG emissions. Yet adaptation is imperative for Africa, as it bears the greatest burden of climate change impacts. Financing for adaptation includes:

1.7.1 Multilateral cooperation

i) GEF funding

The Global Environment Facility was established in 1991 to benefit the global environment by promoting sustainable development linkages between the local, national and global levels. It is a partnership of ten agencies: UNDP, UNEP, WB, FAO, UNIDO, AfDB, EBRD, IDB, IFAD and ADB. The funding available under GEF for adapting to climate change includes:

- GEF I, II and III funds are earmarked for national communications processes, vulnerability and adaptation assessment, capacity building efforts for adaptation and pilot and demonstration projects that address local adaptation needs and generate global environmental benefits in GEF focal areas. They also support community-based adaptation activities under the GEF's small grant programme.
- The Special Climate Change Fund (SCCF) was established to finance the special needs of developing countries, including Africa, in adaptation, technology transfer, climate sensitive sectors and economic diversification for country economies dependent on fossil fuel sector.
- The Least Developed Country Fund (LDCF) was established to support preparation and implementation of National Adaptation Programmes of Action (NAPA). These NAPAs provide a prioritized list of immediate adaptation projects, identifying priority activities whose further delay increases vulnerability or increased cost at a later stage. Only 23.2 percent of the amount earmarked has been disbursed.
- The Strategic Priority for the Adaptation Fund is intended to finance implementation of concrete adaptation projects and programmes, in countries particularly vulnerable to adverse effects of climate change. The funding is provided by a 2% levy on Clean Development Mechanism (CDM) projects, excluding those undertaken in least developed countries and other sources. Examples of these projects include:

In summary, only 31.7 percent of total funds earmarked for adaptation have been disbursed. This raises the question of *whether the developed countries are seriously committed to helping Africa adapt to the impacts of climate change, of which they are the main contributors.*

a) Bilateral cooperation and activities implemented jointly (AIJ)

• The French Global Environment Facility (FFEM)

This is a bilateral fund financed by the French government, over and above the latter's development assistance and its contributions by complementing GEF's activities since 1994. Its goal is to finance the additional costs incurred in protecting the global environment in development strategies. It works in the focal areas of the GEF and concentrates on activities in which it has a comparative advantage over the GEF. It supports projects on energy efficiency, carbon sequestration in forests and soils, and elimination of organic wastes. Examples of projects include multi-country projects such as a support program for the Clean Development Mechanism

and agro-ecology development and carbon sequestration in pan-tropical and Mediterranean agriculture. Country-specific projects include a fuel wood project in Morocco, an agro-ecology action plan in Cameroon, and charcoal production from plant residues in Rosso in Mauritania. Other joint cooperation include:

- French cooperation with other countries in Africa, such as the initiative Recherche interdisciplinaire et participative sur les interactions entre les écosystèmes, le climat et les sociétés en Afrique de l'ouest (RIPIECISA).
- The United States and South Africa are cooperating to assist local governments in the design and implementation of strategies to reduce GHG emissions as, for example, by developing emission inventories, goals, local action plans, policies and measures, and monitoring results.

b) Private sector

- The Investment Climate Facility for Africa is a unique new public-private partnership that focuses exclusively on improving the continent's investment climate. It complements the work the International Finance Cooperation (IFC) already carries out in Africa and provides a mechanism through which the private sector, the G8 countries, donors, and African governments and institutions can support Africa's vision for sustainable growth and development.

Mitigation finances include:

- The Clean Development Mechanism (CDM) is a mechanism for GHG emissions trading permitted under the Kyoto Protocol, Article 12. It allows industrialized nations to fund GHG emission reduction activities in developing countries in return for certified emission reduction credits (CERs). It thus helps industrialized countries achieve their emission reduction targets while promoting the use of clean energy sources in developing countries. .
- The GHG Emission Trading system allows companies or industries that do not reduce their GHG emissions to pay a second party to either reduce GHGs or increase carbon sequestration in the name of the first party to compensate for its excess.

1.8.1 Africa's position on climate change

The African Union at its January 2007 meeting in Addis Ababa recognised adaptation to climate change as a key priority. It seeks more support for adaptation and better integration of climate in development programmes. Furthermore, leaders called for the integration of climate change adaptation strategies into African national and sub-regional development policies, programmes and activities. They also demanded that developed countries undertake deeper cuts in GHG emissions and respect the “polluter pays” and “differentiated responsibilities” principles provided for in the UNFCCC. For Africa, both mitigation and adaptation are important, but the latter is mandatory given that Africa only contributes in a slight way to GHGs emissions but will be the worst hit coupled with multiple stressors besides climate. The AU further noted the urgent need to streamline the Global Environment Facility (GEF) funding mechanisms to ease African countries' access to GEF financial resources; and the called for the exploration of other financial resources and mechanisms to support Africa's adaptation programmes.

1. 8.2 Review of APF/G8 commitments on climate change

The African Partnership Forum brings together participants from G8 countries, the OECD and African countries, with the aim of discussing strategic, political and socio-economic issues relating to African development, and the implementation of NEPAD's programmes. Discussions have focused on four key areas affecting Africa: investment, gender, climate change, and peace and security. The key climate change message is the recognition that climate change is a major threat to development, including the achievement of the Millennium Development Goals in Africa, the continent which contributes least to the problem, and yet is the most vulnerable. More needs to be done both to reduce future emission levels, and to help Africa adapt to the changes, including drought, desertification and flooding that are already happening. The G8/OECD partners also recognized the: legitimate right of Africa to increase its energy supply in a sustainable manner. There is overall agreement that adaptation to climate change on the African continent constitutes a serious and urgent challenge and that there is a need to enhance African capacities in the areas of technological research and innovation, and early warning systems, and to support the capacity of African institutions. The contribution of African forests and the sustainable management of its rainforests, to global climate stabilization are recognized by the APF.

The G8 countries began to discuss the impacts of climate change in Africa in Evian (2003) by agreeing to strengthen international co-operation on global earth observations with a view to developing fully operational regional climate centres in Africa through the Global Climate Observation System (GCOS). At Gleneagles (2005), G8 countries' action plan shifted to a broader focus on energy efficiency, clean technology and support for adaptation. The proposed package includes improvements to energy efficiency; harnessing funding for clean technology in developing countries; support for development of markets for clean energy technologies and to increase their availability in developing countries; and helping vulnerable communities adapt to the impact of climate change.

The progress on implementation of G8 commitments has been modest especially on financing the transition to cleaner energy. The World Bank and AfDB are jointly developing a framework to accelerate the adoption of cleaner, more efficient energy production and use. The recent adoption of an 'Action Plan for Africa on Climate Information for Development Needs (known as *ClimDev Africa*) is the culmination of a multi-year effort by the GCOS-UNECA-Africa Union partnership to address gaps in mainstreaming adaptation into policy. The action plan has been approved, but so far only seed money has been pledged. Tools for climate risk management are being developed and this has stimulated coordinated efforts between the World Bank, the AfDB and other partners; but progress has been slower than expected.

It was within the context of its leadership of the G8 that, in 2006, the United Kingdom, through its Department for International Development, jointly launched the Climate Change Adaptation in Africa programme with Canada's International Development Research Centre. This five-year, CA\$ 65 million programme to support research and capacity building aims to see Africa's most vulnerable people and communities benefit from adaptation. The program currently supports some 20 action research projects, and capacity building activities, in countries across North and sub Saharan Africa.

Other actions outside the G8 include the agreement by the European Union to cut its GHG emissions by 20% by 2020 compared to 1990 levels. Separately, the UK proposes to set a legally

binding carbon emissions reduction target of 60% by 2050. In the United States, the state of California has passed new legislation to cut GHG emissions. In late 2006, 15 US institutional investors managing assets worth US\$ 1600 billion issued a statement calling for urgent and effective action by policymakers and companies to address the threats posed by rising GHGs. The US has not ratified the Kyoto Protocol, yet it is the world's leading emitter, accounting for 23% of global emissions.

1.9 Policy Recommendations and Actions

1. Planning for adaptation cannot take forever: there is an immediate need to move from preparation and planning to focus more on practical adaptation actions., with the information available, even though there may be gaps. Actions must start now, as the poor continue to suffer daily. NAPAs have been developed by some countries, but there are no funds for their implementation. NAPA implementation should be a priority, and countries need both financial and technical support to achieve the set objectives.

2. Implementation of adaptation activities must be done in such a way as to involve various levels (local, national regional and international), recognizing the distinct role each has to play. New partnerships need to be built through solidarity around the central concerns of various regions and countries, which vary greatly. Adaptation strategies must, at a minimum, aim to:

- improve short-term (disaster relief) responses to extreme events while simultaneously reinforcing the adaptive capacity of communities to deal with long-term climate change;
- improve both economic and ecosystem resilience, noting that mal-adaptation and low levels of adaptive capacity for responding to climate stresses has historically been associated with significant economic losses in many regions as well as with irreversible damages to our one and only earth; and
- strengthen the resilience of communities to short term climate variability and climate change risks while promoting integrated and balanced long term development. Faced with scarce resources, governments need to address the lack of adequate human and institutional capacity to deal with uncertainty. They must provide proper governance, political leadership, and the will and guidance to minimise conflicts between competing agendas and difficulties in working with non-state bodies and local communities.

3. Synergies must be enhanced among the multilateral environmental agreements (MEA) agreements, MDGs and other regional initiatives such as NEPAD. Climate change adaptation must also be integrated into development strategies and plans. To do so, the following steps should be taken:

- At the local and national scale, it will be important to improve knowledge and awareness of the most vulnerable communities; improve downscaling of climate model; to adapt early warning systems to smaller scales; integrate climate change issues into social networks, respecting social and cultural values; and strengthen cooperation between national authorities in order to transfer best practises, clean technologies and lessons learnt related to national adaptation programmes and projects.

- At the regional scale, it will be important to identify and improve policies and institutions relevant to climate change, and identify trans-boundary issues and economies of scale for natural resources and energy management.
- At the international scale, it is essential to integrate climate change adaptation within the MDGs and to ensure that additional resources, including international development funds, are well targeted to support Africa countries and communities in adapting to Climate change.

4. A funding mechanism to facilitate and finance adaptation programmes is needed. The adaptation funds needs to be operationalized with immediate effect. Fighting climate change requires a two-tier attack, noting that adaptation is imperative, but an eventual 80% reduction of greenhouse gas emissions is crucial to stabilize the atmosphere for current and future generations. Africa's contribution to support global carbon emissions needs to be recognized and compensated accordingly. This is a case of environmental justice and should be addressed responsibly by all actors and stakeholders.

5. Capacity building initiatives and technology transfer are needed to help Africa develop energy efficient systems that minimise global green house gas emissions. In the process of such collaboration, both developing countries and African institutions and individuals will improve their capacities to do assessments and understand climate change better, to minimise social, environmental and economic losses.

Key message

Joint discussion and efforts to reduce greenhouse gas emissions while helping countries plan and undertake adaptation are already taking place. The immediacy of the climate change problem has to date forced countries, such as those in the arid regions of Africa, into “reactive adaptation”, instead of “planned adaptation”. Climate change now provides a unique opportunity for the international community to question the modes of development currently in practice and to choose a new mode of development for the future. The key development sectors of the economy are at risk, with grave consequences for life on earth if climate change is not addressed. Hence, action must start now and involve all actors.

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