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## **Climate change, clean technology and green growth opportunities in Africa**

### **Note by the secretariat<sup>1</sup>**

### **Introduction**

1. Climate change, as the United Nations Secretary-General has said, is “the defining challenge of our generation”. Its potential consequences for economic and social well-being are so profound that many have preferred to simply avoid imagining the unimaginable. There are, however, numerous solutions that already exist or are in the pipeline, many of which respond to other challenges such as reducing society’s inefficient use of resources, improving food security, health and livelihoods for the world’s poor, providing employment opportunities and even re-energizing a stagnant global economy in a process that is being described as “greening the economy”. These solutions also include renewable energy, energy efficiency in buildings and appliances, combating deforestation, promoting sustainable land-use, conserving ecosystems and approaching development from a green-economy perspective.

2. Climate change is one of the six cross-cutting priority areas of focus of the United Nations Environment Programme (UNEP). UNEP work on climate change is guided by the decisions of its Governing Council/Global Ministerial Environment Forum. Based on its experience and mandate, UNEP identified three priority areas that match calls for international guidance and respond to the urgent need for climate change action at the national and regional levels, namely, clean technology readiness; reducing emissions from deforestation and forest degradation and associated efforts to conserve, sustainably manage and enhance forest carbon stocks (REDD-plus); and ecosystems-based adaptation. In addition, UNEP provides assistance to Governments to green their economies as part of what is known as the “green economy initiative”. UNEP would like to share its expertise in these four areas and assist Governments in reaching their objectives and attaining the targets set out in the Millennium Development Goals.

3. The present document has been prepared in support of the forthcoming thirteenth session of the African Ministerial Conference on the Environment (AMCEN) in Bamako, 21–25 June 2010. It sets out the essentials of the climate change challenge in the African context and highlights a number of key issues that need to be tackled to ensure the formulation of appropriate policy responses by African Governments with international stakeholder support.

### **I. Africa’s response to climate change**

4. According to the Intergovernmental Panel on Climate Change, although Africa is the region of the world that contributes least to global emissions of greenhouse-gas emissions, it is one of the most vulnerable regions to climate change and climate variability.<sup>2</sup> This situation is aggravated by the interaction of multiple stresses, occurring at various levels, and low adaptive capacity. Africa’s major economic sectors are vulnerable to current climate sensitivity with huge economic impacts. Such vulnerability is exacerbated by existing development challenges such as poverty, complex governance and institutional dimensions; limited access to capital, including markets, infrastructure and technology;

1 Presented on behalf of the Executive Director of the United Nations Environment Programme.

2 Intergovernmental Panel on Climate Change (2007). *Fourth Assessment Report*.

ecosystem degradation; and disasters and conflicts, which, in turn, have contributed to Africa's weak adaptive capacity, increasing its vulnerability to projected climate change.

5. The projected impacts of climate change in Africa include an increase in droughts, floods and other extreme weather events, which would exacerbate the stress on water resources, agriculture, food security, human health and infrastructure and thereby constrain development. The Intergovernmental Panel on Climate Change's Fourth Assessment Report (2007) notes that changes in a variety of ecosystems are already being detected. Increased water temperatures and salinity will bring about changes in marine ecosystems (e.g., wetlands, coral reefs, oceans and estuaries). Africa is host to many vulnerable ecosystems, including Lake Chad and the surrounding wetlands, which sustain some 20 million people, and large areas of mangroves in Cameroon, Guinea-Bissau, Nigeria and Senegal. African ecosystems provide vital goods and services, such as crops, fish, wood and wildlife, on which African economies and livelihoods depend.

6. At its twelfth session, AMCEN recognized the need for African countries to work together to tackle the impacts of climate change. In that regard, at the same session, AMCEN adopted a comprehensive framework of African climate change programmes to ensure coordination and coherence in the implementation of climate change initiatives on the continent at all levels.

7. African environment ministers further recognized the need for a common African negotiating position to respond to the challenges of adaptation, finance and technology transfer, and the role that African countries must play in adopting voluntary mitigation actions, with the necessary finance and technological support. In this regard, African institutions, such as the African Development Bank, are exploring new ways to promote low-carbon growth strategies and clean energy sources for enhanced sustainable development.

8. Continued cooperation between African countries will improve the prospects for a robust international climate change agreement that will produce the necessary mechanisms to provide a strong basis not only to combat climate change, but also to transform and green national economies for climate resilience.

9. Thematic policy options and suggested activities in the areas of clean technologies, REDD-plus, ecosystem-based adaptation and green economy are presented in the following sections. Overall, these policy options have been drawn from a variety of sources in the continuing discourse on climate change. UNEP could provide services in most of these areas, based on countries' needs.

## **II. Clean technologies**

10. Energy is central to development, global security, environmental protection and achieving the Millennium Development Goals. The vast majority of rural populations in Africa rely on woody biomass as an energy source.

11. African countries need greater access to clean energy and energy-efficient technologies to ensure that voluntary national mitigation initiatives not only reduce greenhouse gas emissions, but also create green jobs, improve capacity to attract private sector financing for cleaner energy technologies, enhance energy security and reduce the environmental impacts of conventional energy technologies.

12. There is great potential in renewable technologies to meet Africa's growing energy needs. The continent has substantial renewable energy resources such as solar energy in addition to significant hydropower and wind power potential in some subregions. The current contribution of renewable energy sources to Africa's energy mix remains modest, however. Obstacles to their use on the continent include lack of finance, limited infrastructure and lack of technology transfer.

13. Many low-carbon technologies (e.g., solar photovoltaics, light-emitting diode (LED) lighting, more efficient power generation) are already commercially viable but their transfer to new markets remains a challenge. In an assessment conducted for developing countries by the secretariat of the United Nations Framework Convention on Climate Change<sup>3</sup>, over 60 per cent of respondent States identified various barriers: financial barriers, economic and market barriers; lack of human capacity, lack of information or awareness about opportunities; institutional weakness; regulatory and policy-related barriers. In addition, technology transfer and capacity-building are key to ensuring adequate development and deployment of clean-technologies.

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<sup>3</sup> United Nations Framework Convention on Climate Change (2009). Development and transfer of technologies: second synthesis report on technology needs identified by Parties not included in Annex I to the Convention. FCCC/SBSTA/2009/INF.1.

**To overcome such barriers, strong government action and policies are required in the following areas:**

**Analysis:** Undertake analyses of renewable energy potentials (solar, wind, hydro), review and prioritize technology needs through technology needs assessments and action plans;

**Planning:** Develop technology action frameworks and low-carbon growth plans; identify nationally appropriate mitigation actions within the context of national development priorities.

**Policy measures:**

- Improve the design and careful targeting of energy subsidies;
- Provide economic incentives for clean technologies, including for small-scale and medium-scale enterprises;
- Adopt energy efficiency standards for industry and buildings;
- Set realistic emissions reduction targets and provide incentives for specific sectors such as transport and construction;
- Reorient regulatory policy frameworks, including tariff structures and market regimes, to stimulate business innovation and private sector participation;
- Integrate capacity-building and awareness-raising in national strategies, involving stakeholders such as local populations and finance communities.

### **III. Reducing emissions from deforestation and forest degradation and associated efforts to conserve, sustainably manage and enhance forest carbon stocks**

14. The forest sector accounts for some 17 per cent<sup>4</sup> of global greenhouse-gas emissions, mainly through deforestation. At present, the world loses about 120–240 km<sup>2</sup> of forests every day. Some of the world's most marginalized communities depend on forests for their subsistence, livelihoods and cultures, with current estimates suggesting that over 1 billion people depend on forests for their livelihoods.

15. Activities to reduce emissions from deforestation and forest degradation in developing countries are crucial in efforts to combat climate change. At its twelfth session, AMCEN recognized the vital role played by African forests in regulating the global climate system, in addition to providing goods and services to millions. Africa is home to large and diverse forest ecosystems. The Congo Basin, for example, which stretches across Cameroon, Congo, Central African Republic, Democratic Republic of the Congo, Equatorial Guinea and Gabon, is the second largest rainforest in the world.<sup>5</sup>

16. The REDD-plus initiative presents opportunities to conserve forests. While a number of voluntary REDD projects are under way in Africa with scope for more, it must be clarified that these are not connected in any way to current negotiations under the Framework Convention on Climate Change. REDD-plus provides a unique opportunity to shift the forest sector on to a green economy pathway within the coming 10–20 years. Indeed, it is difficult to imagine how greenhouse-gas emissions from forests might be sustainably mitigated without such a shift.

17. Overall, the net benefits of halving deforestation could amount to \$3.7 trillion in the long term.<sup>6</sup> Targeted public investments could generate around 10 million new jobs<sup>7</sup> in afforestation, reforestation, management of natural forests, establishment and management of urban and peri-urban green spaces, and improvement of watersheds, while addressing demand for fuel and non-wood products and improving local livelihoods. The returns on such investments could be increased by leveraging

4 Intergovernmental Panel on Climate Change (2007), *Climate Change 2007: Synthesis Report*.

5 International Union of Forest Research Organizations (2009). *Making African Forests Fit for Climate Change: a Regional View of Climate-Change Impacts on Forests and People, and Options for Adaptation*.

6 Eliasch, Johan. 2008. *Eliasch Review – Climate change: Financing Global Forests*. Surrey, England, Government of the United Kingdom of Great Britain and Northern Ireland, Office of Public Sector Information.

7 Nair, C.T.S., Rutt, R. 2009. *Creating forestry jobs to boost the economy and build a green future*. Rome, Italy, Food and Agriculture Organization of the United Nations.

additional returns from ecosystem services other than carbon. Paying to keep forests standing makes sound ecological and economic sense, but current barriers to sustainable use must be overcome.

18. For a country to be able to transform its forest sector on to a low-carbon economy trajectory, policy and normative interventions are required at the national and subnational levels. At the national level such interventions would be spelled out as a result of developing and implementing national REDD-plus strategies that enshrine the principle of free, prior informed consent and maintain environmental and social safeguards. At the regional level it may require improvements to coordination, while at the global level policies affecting the national drivers of deforestation would need to be taken into account (e.g., timber trade, agriculture subsidies, public procurement).

#### **Policies and instruments to promote the development of the forest sector in a green economy**

**Analysis:** Undertake social and economic analyses of forests and relevant sectors, focusing on current products, services and livelihoods and potential alternative uses of those forests, keeping in mind the nature of the livelihoods and cultures that depend on them.

#### **Planning:**

- Develop scenario-based planning to take advantage of the combinations of carbon benefits with other ecosystem services for improved livelihoods, green jobs and development opportunities;
- Develop national strategies and mechanisms to develop or update the vision for the forest sector, broadening it to include related sectors, scales and stakeholders.

#### **Policy measures:**

- Provide economic incentives for the conservation and sustainable management of forests, including for local and small-scale and medium-scale enterprises;
- Reorient regulatory policy frameworks to stimulate private sector participation;
- Set realistic maximum deforestation targets and provide adequate resources for enforcement;
- Integrate capacity-building and awareness-raising in national strategies, involving stakeholders such as local populations and finance communities;
- Reinforce social and environmental safeguards by integrating the strengthened protection of community rights and of environmental safeguards.

19. Although there are regional dimensions to the spatial scales at which ecosystem services from forests are derived, REDD-plus and ecosystem services are not confined by national borders. There are sound economic and political reasons for countries to seek common ground and efficiencies at the regional level. Regional approaches would help to tackle transboundary issues and possible risks of leakage.

## **IV. Ecosystem-based adaptation**

20. The impacts of climate change are already affecting the functioning and integrity of ecosystems (e.g., wetlands, drylands, coastal and mountain ecosystems) and compounding the stress resulting from anthropogenic interventions.<sup>8</sup> Climate change is further challenging the capacity of ecosystems to provide all the services upon which a multitude of sectors and communities depend. Over 1 billion people in more than 100 developing countries are currently locked into a cycle of poverty and environmental degradation that is aggravated by the effects of climate change.

21. There is irrefutable evidence that the conventional path of economic growth often leads to ecosystems degradation, resulting in the increased vulnerability of the ecosystems and the communities that live near or in them. Healthy ecosystems and their services offer opportunities for sustainable economic prosperity while providing a defence against the negative effects of climate change.

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<sup>8</sup> According to the Millennium Ecosystem Assessment, approximately 60% (15 out of 24) of the ecosystem services it examined are being degraded or used unsustainably, including fresh water, capture fisheries, air and water purification, and the regulation of regional and local climate, natural hazards, and pests.

22. Africa accommodates many fragile terrestrial and coastal ecosystems, which many Governments have taken steps to protect. The Government of Guinea-Bissau has launched a mangrove project to demonstrate how the improved management of mangroves can help to reduce climate change impacts in coastal zones. The Government of Kenya is seeking to implement a \$99 million restoration of the entire Mau Forest complex, the largest closed-canopy forest ecosystem in Kenya covering more than 400,000 hectares. In so doing, it recognizes, in the Prime Minister of Kenya's own words, that "Kenyans have accepted that the restoration of the Mau and other water towers is a critical sustainable development imperative. Consensus has now emerged that the very existence of many communities and the welfare of the country depend on how we live with our forests and our ecosystems, and indeed how we address the key environmental challenges of our time".

23. The overarching goal of ecosystem-based adaptation is to help vulnerable communities adapt to climate change through good ecosystem management practices and their integration into global, regional, national and local climate change strategies and action plans.

#### **Ecosystem-based adaptation activities and policies crucial for African countries include:**

##### **Analysis:**

- Undertake impact or vulnerability assessments and analyses of ecosystem services and economic values;
- Develop methodologies and tools for such assessments and analyses;
- Undertake feasibility studies of national and large-scale transboundary projects.

**Planning:** Integrate ecosystem-based adaptation into national adaptation programmes of action, poverty reduction strategies and other related national strategies and development plans.

##### **Policy measures:**

- Provide economic and regulatory incentives for technology development and diffusion, for better access to viable technologies for ecological restoration and engineering for adaptation and disaster risk reduction;
- Develop comprehensive regulatory measures in areas related to ecosystems and their services, such as water, forests, biodiversity, agriculture and livestock rearing, energy, disaster prevention;
- Integrate capacity-building and awareness-raising in national strategies, involving stakeholders such as local populations and finance communities.
- Reinforce social safeguards by integrating strengthened protection of community rights.

24. Even though each ecosystem and each community is unique in itself, many are facing similar threats from climate change. The challenge therefore lies in understanding good practices and standardized approaches. Mainstreaming good ecosystem-based adaptation practices is achievable and requires a structured approach across African countries supported by a continuous learning and capacity-building process.

## **V. Green economy**

25. The world is being challenged by crises on many fronts; the economic crisis that erupted in 2008 has pushed many countries into recession, affecting businesses, jobs and the prices of food and fuel, among other things. While various factors have contributed to the many challenges, a common denominator is identifiable, namely, patterns of investment that have failed to deliver on the objectives of sustainable development, while adding to human and ecological risks. As Governments worldwide devise policy responses, there are fundamental lessons to be learned. Any sound national strategy to tackle economic and climate change challenges must integrate a greening of the economy.

26. In 2008, as States struggled with successive food and fuel price surges and persistent environmental challenges compounded by a biting economic crisis, UNEP launched the global green new deal or green economy initiative. The initiative is based on the idea that the economic models of the twentieth century are unlikely to assist in attaining the multiple internationally agreed goals on

issues ranging from combating climate change to ensuring adequate freshwater and food supply and overcoming poverty.

27. Greening the economy refers to a process of reconfiguring businesses and infrastructure to ensure better returns on natural, human and economic capital investments, while reducing greenhouse-gas emissions, waste and social disparities. A green economy is characterized by substantially increased investments in economic sectors that build on and enhance the earth's natural capital or reduce ecological scarcities and environmental risks. Such sectors include renewable energy, low-carbon transport, energy-efficient building, clean technologies, improved waste management, improved freshwater provision, sustainable agriculture and forest management and sustainable fisheries. Increased investments must be driven or supported by national policy reforms and the development of international policy and market infrastructure.

28. Africa has seen some gains in terms of economic growth over the past decade and has significant future potential in that regard. Climate change and variability pose considerable challenges to economic growth, sustainable development and poverty reduction. In recognition of that fact, many African Governments have committed themselves to creating the enabling conditions required to support the move towards a green economy. In May 2009 in Kigali, African finance, economic planning and environment ministers at a first joint meeting adopted a communiqué of historical importance, in which ministers recognized the need to create an enabling environment to support the transition to a green economy and pursuing low-carbon growth, as a prerequisite for African countries to benefit from existing opportunities.

29. At the national level, various African countries have recognized the opportunities afforded by a green economy and are taking encouraging steps to formulate national green economy plans.

30. Policies that lead to a green economy must support both the development and transfer of environmentally sound technologies, such as affordable technologies for energy provision and technologies to support climate change mitigation and adaptation including ecosystem-based adaptation. Such policies must also integrate forest and agricultural services in national and regional plans.

#### **Suggested policies and actions to stimulate a green economy:**

##### **Actions:**

- Support green jobs creation in diverse sectors. A global transition to a low-carbon and sustainable economy could lead to the creation of large numbers of green jobs in many economic sectors, and indeed could become an engine of development;
- Enhance awareness-raising among the population of environmentally friendly goods and services;
- Undertake macroeconomic and sector-specific assessments to identify sectors with high potential to foster a green economy transformation.

##### **Policy measures:**

- Develop national capacity-building strategies for public and private finance communities;
- Formulate national green economy plans, building on existing greening strategies, policies and programmes related to sustainable development and poverty reduction;
- Create public and private financial incentives for small-scale and medium-scale enterprises; easing the costs and risks of entry of new financial stakeholders;
- Promote public funding for sustainable industry and businesses to help to mainstream good practices;
- Initiate national policy reforms and engage in the development of an international policy and market infrastructure to support green investment.