



Keeping Climate Impacts at Bay:

A 6-Point Strategy for Climate-Resilient Economies in Africa



United Nations
Economic Commission for Africa

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Publications
Economic Commission for Africa
P.O. Box 3001
Addis Ababa, Ethiopia

Tel: +251 11 544-9900
Fax: +251 11 551-4416
E-mail: ecainfo@uneca.org
Web: www.uneca.org

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Foreword

Keeping Climate Impacts at Bay: A 6-Point Strategy for Climate- Resilient Economies in Africa is a product that has arisen from a speech that I delivered during the Third Climate Change and Development in Africa Conference (CCDA III) on October 21st 2013 in Addis Ababa.

In this speech, I expressed my vision for Africa and articulated the continent's climate needs via a 6-point climate strategy which have the potential to enable African institutions to renew their engagement with climate change impacts and craft effective policies that will help to facilitate climate resilient societies and economies.

I laid out a practical plan that will enable African countries to harness their huge potential in renewable energy resources (solar, wind, hydropower, geothermal and biomass) and expressed a clear vision for Africa as it seizes the momentum and leaps closer to new innovations, in the process breaking through entrenched energy barriers, through technology leapfrogging. I pointed to the need for structural transformation and for Africa to march towards industrialization and inclusive growth. I focused on agriculture as the principal foundation for Africa's growth, and warned that there can be no structural transformation if the agricultural sector does not act as the hub and a conduit that will give sway to Africa's thirst for

a performing, productive, resilient, entrepreneurial and climate smart agricultural sector.

My vision of a climate resilient development pathway is one that recognizes the centrality of science as the lubricant that will bring societies together, and one in which human security becomes a central element of our collective quest. In recognizing the multifaceted challenges of developing economies and transforming lives in a changing climate, and by adopting a positive and proactive approach to climate change, I believe that solutions lie within our generation to keep climate change impacts in check and to translate these into business opportunities. In doing so, I strongly believe that the ability to take measures leading towards environmental sustainability is within our hands. They shape our trajectory; they are oblivious to boundaries, they start with the way we care for our oceans, the way we manage our tourism industries; our efforts to conserve and harvest water, and above all, an avid and intrinsic need to learn from each other through a culture of co-operation in generating and sharing knowledge. Climate change can change us – but it is our duty to catalyze a set of positive cascading changes in critical development sectors that will spell shared prosperity for our people and a hopeful and prosperous future for generations to come.

Carlos Lopes

United Nations Under Secretary General and
Executive Secretary of the Economic Commission for Africa

Keeping Climate Impacts at Bay: A 6-Point Strategy for Climate-Resilient Economies for Africa

Development is key to Africa's social and economic transformation. This transformation consists of creating opportunities for productive jobs, and securing livelihoods for inclusive growth. Raising productivity to accelerate and sustain growth through agricultural intensification and value addition; , embarking on an industrial pathway; creating an enabling environment for businesses to flourish and supporting new ways of producing and consuming that sustain the environment are key transformational prerequisites¹

At the same time, the countries of Africa must work to transform their economies in the knowledge that climate change is likely to have significant impacts throughout the continent that will affect development. The recent Fifth Assessment report of Working Group II of the Intergovernmental Panel on Climate Change emphasizes that Africa is highly vulnerable to climate change. Some broad conclusions are that African ecosystems, including ocean ecosystems, are already being affected by climate change, and future impacts are expected to be substantial. The report also notes that climate change will amplify existing stress on water availability in Africa; that it will interact with non-climate drivers and stressors to exacerbate vulnerability of agricultural systems, particularly in semi-arid areas. Climate change will be a multiplier of existing health vulnerabilities, including food insecurity, insufficient access to clean water, and exposure to diseases such as malaria.² Moreover, the effects of climate

variability in Africa are already well known. For example, severe droughts in 2011 in the Horn of Africa and the 2012 drought in the Sahel affected over 23 million people. In 2013 floods devastated Port Louis in Mauritius after 156 millimeters of rainfall fell in under two hours.³

Africa needs a climate-development policy that responds to its unique vulnerabilities to climate change and that can take advantage of the substantial natural and human resources the continent possesses. This is why I believe that a six point strategy will be a clear blue print to address many of the challenges that I would like to highlight in this publication. These challenges are as follows:

- (i) Invest more in climate science, services, and high-quality climate and climate-related observations;
- (ii) Craft effective climate policies and improve both governmental and non-governmental institutions that can efficiently implement those policies, for example, through improving coordination and through mainstreaming climate change policies in national development plans;
- (iii) Invest in South-South partnerships such as with the African, Caribbean, and Pacific group of states in order to systematically share experiences and lessons learned;

¹ African Centre for Economic Transformation, *African Transformation Report*, Chapter 6—Kickstarting Agroprocessing Value Chains. 2014.

² Intergovernmental Panel on Climate Change, Fifth Assessment Report, Working Group II, *Climate Change 2014: Impacts, Adaptation,*

and Vulnerability. Volume II, Regional Aspects, Chapter 22: Africa. March 2014.

³ Statement by Mr. Carlos Lopes, Executive Secretary of the UNECA, Third Annual Conference on Climate Change and Development in Africa, October 2013.

- (iv) Pursue a low carbon, clean energy development pathway and rapidly scale up clean energy technologies; with consideration for changing climate conditions.
- (v) Invest in agricultural development through sustainable land management, investment in production technologies and water use efficiency, and by scaling up agro-processing; and
The following sections expand on the above recommendations.
- (vi) Develop Africa’s tourist industry in a sustainable, eco-friendly way, and in particular

Strategy 1

Increased Investment in climate observations, climate science, and climate services

The foundation for elaboration of an effective African climate-development policy lies in the availability of high-quality climate observations and data. This cannot happen without the expansion of African climate science, and the improvement and development of useful climate services.

Adequate high-quality observations of climate variables are vitally important to properly address such diverse needs and interests ranging from water resources management, agriculture and food security, preparedness for natural disasters such as floods and droughts, health concerns, energy production, urban planning, and coastal zone management

Quality climate observations are fundamental to reducing losses from extreme events, to maximizing outputs from the agriculture sector, to reducing the incidence of disease, and to enhancing the design and location of long-lasting infrastructure. Among other things, expanded and improved networks would also assist with the delivery of the Millennium Development Goals (MDGs) and adaptation to climate change. It would also contribute to the development of climate risk management services, integrated water resource management, and real-time environmental monitoring.

It has long been the case, however, that the observing networks of Africa are both inadequate and inefficient, thus making it difficult to effectively address African

development needs. The National Meteorological and Hydrological Services (NMHSs) of each African country and other climate service providers must greatly strengthen their observational networks and enhance their capacity to deliver a full range of climate services in support of sustainable development. In particular, the deterioration of climate observing networks and stations needs to be reversed. This can be accomplished through renovation of existing stations and through the installation of new stations where needed. The maintenance of all stations needs to be sustained over time, data management and archive systems need to be improved, and rescue of valuable historical data that are not available electronically needs to be undertaken.⁴

While improvements in Africa's climate observing systems are necessary, observations alone are not sufficient to address what Africa needs to do to address climate change. Scientific understanding of the climate system is vital to accurately predict climate change and to help users incorporate the inherent uncertainty of future climate into decision-making. However, scientific understanding of the African climate system is limited, and the level of understanding varies significantly from region to region. Although it is improving, understanding the drivers of African climate and its complex interactions is still relatively poor. This limited knowledge inhibit the the ability to

⁴ B. Nyenzi, T. Dinku, S. Awulachew, *et al.*, "An Assessment of Africa's Climate Data, Observing Networks, and Data Rescue Strategies," CCDA Conference paper, UNECA/ACPC, Addis Ababa, Ethiopia, November 2011.

analyze and understand Africa's climate variability, detect and attribute climate change, and predict the climate with an appreciable degree of accuracy. These deficiencies in turn limit the ability of African countries to manage climate variability and adapt to climate change and will therefore have a negative impact on development.⁵

In this regard, the Africa Climate Conference 2013 (ACC-2013) in Arusha, Tanzania was organized to assess climate science needs in Africa. It brought together some 300 scientists and other experts from Africa and around the world to discuss the state of knowledge on the African climate system, identify current gaps in climate knowledge, and define an agenda to advance the frontiers of African climate research. Participants made a number of recommendations and drafted an ambitious "African Climate Research Agenda for Climate Services and Development." The agenda contains four overarching priorities within which are included a number of specific programme elements. The **first** priority calls for the creation of co-designed multi-disciplinary research for improving climate forecast skill and reliability across time and space, with an ultimate goal of implementing operational, end-user-relevant forecast products. The **second** element proposes filling gaps in multidisciplinary data sets, including gaps related to specific climate variables and gaps in sector-specific vulnerability datasets, such as in the agriculture sector. The **third** focuses on building Africa's scientific and institutional capacity to undertake climate research. It is clear that African universities, national climate training and research institutes, regional climate centres, and other climate-related organisations need to enhance their capacity

development programmes in climate science research, applications, policy, and associated fields. . The **fourth** agenda priority calls for mainstreaming climate services into decision-making. Doing this will require more effective communication between climate scientists, policymakers, and sectoral end users of climate information.⁶

Climate services—based on the availability of quality observations and good science—are naturally what will be of most direct interest to farmers, health experts, urban planners, energy developers, water resource managers, coastal zone management experts, and average citizens who use climate information in their daily lives. Recognizing the need for high-quality climate services to contend with a changing climate, the World Meteorological Organization spearheaded the development of a major UN-led initiative, the Global Framework for Climate Services (GFCS). The GFCS vision is "to enable better management of the risks of climate variability and change and adaptation to climate change, through the development and incorporation of science-based climate information and prediction into planning, policy and practice on the global, regional and national scale."⁷

As with the improvements that are needed in climate observations and climate science in Africa, improved climate services will require substantial funding. In the final analysis, however, better observations, enhanced climate science, and improved climate services for Africa will lead to substantial improvements in the quality of life of resource dependent populations in Africa.. They are the foundation for transformational development in critical development sectors such energy, agriculture and tourism.

5 T. Dinku, T. Arivelo, S. Awulachew, A. Kamgaf, *et al.*, "Climate Science, Information, and Services in Africa: Status, Gaps, and Policy Implications," CCDA Conference paper, UNECA, Addis Ababa, Ethiopia, November 2011.

6 Africa Climate Conference 2013, Conference Statement: See http://www.wmo.int/amcomet/sites/default/files/field/doc/events/acc2013_final_declaration.pdf

7 See <http://www.gfcs-climate.org/vision>

Strategy 2

Strengthening effective climate policies and enabling the existence of strong institutions

The availability of high-quality climate observations, cutting-edge science, and adequate climate services are the foundation of sound climate-development policy. However, they are not sufficient. Climate and climate-related policies put in place by Africa's various governing bodies establish short- and long-term objectives and provide guidance on development pathways.

In Africa, one principal obstacle affecting the integration of climate issues into development activities is related to weak institutions. The science policy interface is weakened by the inability to translate scientific findings into effective policy recommendations. There is an increased recognition of the need for intermediary organizations that can serve as knowledge brokers at the science-development –policy interface and capacity builders for researchers and policy makers. Indeed, a large number of institutions in Africa are concerned with climate change, either as their principal mandate or as an important factor affecting their strategic goals. Most countries have energy, environmental, and agricultural departments, and meteorological and other services that have a direct or indirect role in drafting and implementing climate policies. Typically, climate is not the sole, or even principal, concern of these national governmental institutions. However, it is vitally important that they have adequate resources for their climate-related mandates. Without such funding, it will not be possible to effectively implement even the most enlightened policies

Africa's National Meteorological and Hydrological Services (NMHSs) are perhaps the most directly concerned

of government agencies with climate and climate change mandates, and yet they have been chronically underfunded throughout Africa. Many government organizations offer, or need to offer, climate services related to their operational work. However, it is the NMHSs that provide the primary climate observations and information and services upon which others rely. They simply cannot function without deploying adequate resources in relevant areas.

Other institutions have a role to play at the regional level. Most important are the Regional Economic Communities (RECs) and Regional Climate Centres (RCCs). There are eight RECs in Africa. Among other things, the RECs promote and coordinate economic development at the regional level, including in the agricultural, energy, and water resources sectors. The RECs also facilitate regional approaches to coping with natural disasters such as floods and droughts. In each of the RECs, the World Meteorological Organization (WMO) is extending its basic infrastructure by designating RCCs, usually by helping to upgrade existing centres, to generate and deliver more regionally-focused high-resolution data and prediction products for climate services, especially in support of climate adaptation and risk management.⁸

At the continental scale, the African Union Commission (AUC) and the UN Economic Commission for Africa (UNECA) are engaged in climate change policy development. An important technical body of the African Union is NEPAD, the New Partnership for Africa's

⁸ See <http://www.wmo.int/pages/prog/wcp/wcasp/RCC-Africa.html>

Development. NEPAD's Climate Change and Natural Resource Management programme plays a coordinating and advocacy role to promote regional and national programmes aimed at counteracting environmental threats. NEPAD understands that addressing environmental issues is a pre-condition for sustainable growth and development.⁹

The African Climate Policy Centre (ACPC), housed within the UNECA, deserves singular mention as an institution especially created to address climate change policy in Africa. The goal of the ACPC is to undertake climate policy research focused on facilitating sustainable development and managing climate risks. It also initiates activities to inform decision makers at various levels on ways to achieve these goals, for example, through the annual Climate Change and Development in Africa Conference that it organizes. It is engaged in research, knowledge sharing, and networking; advocacy and consensus building; and capacity mobilization, capacity building, and technical assistance.¹⁰ Significantly, the ACPC serves as the secretariat for the Climate for Development in Africa (ClimDev Africa) Programme. Another organization of note is the African Centre for Meteorological Applications for Development (ACMAD). ACMAD's focus is on improving the availability of climate and meteorological information. Although it functions like an RCC, it has a pan-African mandate and serves to coordinate other African RCCs.

Still other continental-scale fora and institutions exist that deal with policies and/or programmes that address climate change. These include three Ministerial Conferences—the African Ministerial Conference on the Environment (AMCEN), the African Ministerial Conference on Water (AMCOW), and the African Ministerial Conference on Meteorology (AMCOMET). These three bodies meet about once every year or two to provide political leadership, policy direction, and advocacy in their domains of expertise for Africa as a whole.

Finally, a number of international organizations play an important role in climate and/or development policy in Africa. These include the World Meteorological Organization, the United Nations Environment Programme, and the United Nations Development Programme, all of which administer multiple ongoing projects and programmes and provide substantial funding for climate change activities in Africa. In addition, Africa is now playing an increasingly important role in the meetings of the United Nations Framework Convention on Climate Change, as it is clear that decisions taken in this forum could have a major impact in Africa. Hence, Africa has an increasingly strong desire to influence the outcomes of these negotiations.

With so many institutions involved at so many different levels in planning related to climate change in Africa, coordination of policies and activities necessarily becomes important. Without adequate coordination, effective delivery on the ground becomes challenging. Africa is not alone in needing to improve coordination among institutions. Developed and developing countries alike often find it difficult to coordinate activities, as institutional rivalries, lack of adequate funding, and/or lack of the requisite expertise may complicate coordination. Improved coordination is needed within individual African countries. It is also needed at the regional, continental, and international scales. Adequate funding is inevitable, but improved coordination at all levels will unquestionably allow for great effectiveness on the ground. Improved coordination will also enable countries to share experiences and to learn from the best practices.

Beyond policy development and adequate coordination is the need for effective implementation of policies. A good policy can take one only so far; without the wherewithal to implement the policy, a good policy cannot accomplish much. Good governance is the first requirement for implementation. Also needed are adequate financial resources and people with the right skills to implement the policy. It can be distressing to realize that many good policies sit on shelves gathering dust for lack of

9 See <http://www.nepad.org/climatechangeandsustainabledevelopment>

10 See <http://www.climdev-africa.org/afrian-climate-policy-center>

resources or a champion to spearhead action. It can also be frustrating to comprehend that as time passes and personnel change, it is easy for the knowledge gained at one time or place to be lost, requiring different organizations unnecessarily to “reinvent the wheel.”

An important element of implementation is the necessity of mainstreaming consideration of climate change in national development plans and policies. Given the importance and long-term nature of such plans and the likely impacts that climate change will have on various development

projects, it is simply good planning to take these impacts into account when planning for the future. Much has been written about the subject. Finally, the foundation for all efforts to improve policies and institutions related to climate change is education. Africa has been making great strides in recent years in educating the people who will be needed to lead Africa’s development. Nevertheless, many more experts will be needed, including not only climate scientists, but also experts in all of the sectors that will be affected by climate change, as well as experts in policy development and administration.

Strategy 3

Leveraging South-South Partnerships

Cooperation between developed and developing countries to help Africa and other developing regions adapt to climate change is vitally important, and clearly many bilateral and international mechanisms exist to facilitate this cooperation. However, South-South cooperation is also becoming important. With so much happening in developing countries, both as a result of indigenous efforts and lessons being learned about coping with climate change that can be profitably shared between and among developing countries.

The rationale and principles of South-South cooperation were set out at the high-level United Nations Conference on South-South Cooperation in 2009 in Nairobi. South-South cooperation embraces a multi-stakeholder approach, including non-governmental organizations, the private sector, civil society, academia, and other actors that contribute to meeting development challenges and objectives in line with national development strategies and plans.¹¹ Also increasingly important is the notion of triangular cooperation. Such cooperation typically encompasses a traditional donor, for example from an OECD-member country, an emerging donor from the South, and a beneficiary country in the South.¹²

To date, cooperation on climate change has rarely been the focus of South-South cooperation, but clearly much potential for partnerships exists. There is obvious potential

for sharing experiences, for example, among African, Caribbean, Pacific countries, most of which face similar climate-related challenges. This group of 79 states has organized itself into the African, Caribbean, and Pacific Group of States (ACP). With headquarters in Brussels, Belgium where it works in association with the European Union, it also has connections with such institutions as the African Development Bank and the African Regional Economic Communities (RECs).¹³ In December 2013 representatives from the three ACP regions, as well as representatives from the ACP Secretariat, WMO, the European Union, and others met to discuss how the Global Framework for Climate Services (GFCS) could be implemented in ACP countries. An important outcome of the meeting was the decision to develop a concept note on an inter-regional GFCS for Africa, the Caribbean, and the Pacific for submission to the European Union for funding under the 11th European Development Fund (2014-2020).¹⁴ The ultimate goal will be to strengthen the delivery of climate services in these countries. This will surely be accomplished, at least in part, by sharing best practices and lessons learned among ACP countries in developing and disseminating climate services.

India's Energy and Resources Institute (TERI) is engaged in South-South cooperation in Africa. In general, its initiatives involve mutual capacity enhancement of institutions, technology transfer, and exchange of knowledge and skills. It has conducted training in renewable energy, energy efficiency, and climate change and sustainability. One relevant project (in partnership also

11 UN General Assembly, Nairobi outcome document of the High-level United Nations Conference on South-South Cooperation, resolution 64/222, annex, paras. 18-19. 23 February 2011.

12 The World Bank Institute, "Triangular Cooperation: Opportunities, Risks, and Conditions for Effectiveness." See <http://wbi.worldbank.org/wbi/devoutreach/article/531/triangular-cooperation-opportunities-risks-and-conditions-effectiveness>.

13 See <http://www.acp.int/node>

14 See <http://caribbeanclimateblog.com/2013/12/13/5cs-participates-in-first-meeting-of-the-gfcs-africaacp-task-team/>

with the UK's Department for International Development) has involved provision of clean cook stoves and solar lanterns to select rural households of Ethiopia and Kenya. Another (in partnership with the World Bank) focused on adaptation in Africa's agriculture sector. And, TERI has partnered with the Africa Climate Policy Centre to produce a paper on climate change and its implications for human development, security, and ecosystem sustainability in Africa as well as vital training and capacity building activities in key ministries.¹⁵

Another example of growing South-South cooperation is a recent agreement between China and the United Nations Environment Programme (UNEP) to boost South-South cooperation on climate change adaptation, notably in

Africa and Asia. As part of this agreement China has contributed US \$6 million to a UNEP trust fund to be used to enhance green development and sustainable environmental management. It plans to continue to make contributions to that fund.¹⁶ Among a number of funding sources, the African Development Bank South-South Cooperation Trust Fund is noteworthy. The AfDB provides support to African countries in mobilizing and taking advantage of development solutions and technical expertise available in the South.

Numerous other examples of the growing importance of South-South partnerships could be cited. Over time, these partnerships will help to accelerate sustainable development in Africa.

¹⁵ See http://south-south.connect.teriin.org/index.php?option=com_content&task=article&id=6

¹⁶ See <http://www.unep.org/NewsCentre/default.aspx?ArticleID=10854&DocumentID=2788>

Strategy 4

Harnessing clean energy potential

It is estimated that 650 million people in sub-Saharan Africa will be living without electricity in 2030 compared to 500 million today.

As Africa develops, the vast renewable energy potential in the region gives it an opportunity to pursue a low carbon development pathway that will have payoffs in minimizing increases in greenhouse gas emissions, reducing dependence on increasingly expensive fossil fuels and carbon-intensive technologies, and developing the energy sector at the local level). Using the newest renewable energy technologies and the best energy efficiency practices where feasible, Africa can move in the direction of a green and clean energy future.

The International Renewable Energy Agency (IRENA) has noted that the rapid growth and diversification of African economies will need to be fueled by a massive investment in energy and that there is a unique opportunity to meet future growth with renewable sources. Africa has vast renewable energy resources that include wind-, solar-, geothermal-, and hydro-power, and bioenergy. IRENA is confident that development of these resources can cover most of Africa's demand by 2050. Furthermore, developing renewable sources of energy often makes good business sense even without subsidies, as the costs of technology are falling and demand is growing. Moreover, many renewable energy technologies are cheaper than diesel- or kerosene-based systems and cheaper than extending the electricity grid into rural areas with low per capita energy demand.¹⁷

¹⁷ IRENA, "Working Together to Build an East and Southern African Clean Energy Corridor," 2013.

Perhaps the renewable energy source with the greatest potential for expansion in Africa is bioenergy. It is already an important source of energy in Africa, as about 65 percent of Africans, mainly in rural areas, use traditional biomass for cooking. However, this traditional use is unsustainable and inefficient, as it has led to deforestation and, as a result of the indoor air pollution it causes, health problems. Nevertheless, there is huge potential for deploying modern, more efficient, biomass fuels in Africa. Modern biomass technologies, such as biogas and improved cooking stoves, could be used as substitutes for traditional cooking stoves. Biogas could also be used for power generation and transport. Bioenergy, in the form of bioethanol and biodiesel, could serve as a substitute for some petroleum products used in transport. The benefits of bioenergy include reduced greenhouse gas emissions, employment in rural areas, foreign exchange savings, and reduced dependence on imported sources of energy.¹⁸

There is likewise significant potential to expand hydropower in Africa, as less than 5 percent of Africa's technically feasible hydropower potential had been exploited by the early 2000s.¹⁹ Large-scale hydropower development opportunities, some of which would be cross-boundary projects, could provide a substantial amount of power to meet Africa's demand for a sustainable source of electricity. In any case, there is significant potential for the expansion of solar energy use in Africa and not only in

¹⁸ E. Hagan, Y. Mulugetta, H. Gujba, C. Speranza, et. al., "Critical Issues in Bioenergy for Africa: Exploring the Opportunities, Constraints, and Trade-Offs." UNECA/ACPC Working Paper, 2011.

¹⁹ E. Kalitsi, "Problems and Prospects for Hydropower Development in Africa," paper prepared for a workshop for African Energy Experts on Operationalizing the NEPAD Energy Initiative, 2–4 June 2003, Dakar, Senegal. p. 7

the Sahara. For one example, South Africa is seeking to reduce its dependency on coal--the most carbon-intensive fossil fuel (and one which accounted for about 86 percent of its energy in 2013)--by increasing its generation of clean energy to 18 gigawatts (GW) by 2030, about half of which would be solar.²⁰ Google, Inc. is backing this effort and has invested some \$12 million in the Jasper Power Project, a 96 MW solar photovoltaic (PV) plant in Northern Cape.²¹ Senegal, Mozambique, Zimbabwe, and many other countries in Africa are investing in solar energy. Strengthening legislation across sub-Saharan Africa for managing solar energy off-grid could greatly boost solar energy projects.²² Indeed, the European Commission's Institute for Energy suggest that just 0.3% with the sunlight that shine on the Sahara and the Middle East deserts could supply all of Europe's energy needs.

Likewise, there is significant potential for development of small-scale hydropower projects to extend electricity service and increase electricity access to remote areas. There is also a need to rehabilitate and improve operationally existing hydro projects.²³ Hydropower development, however, is not without often significant environmental and social impacts, and hence in-depth planning, assessment, and monitoring of projects is essential. For example, the proposed Grand Inga project is capable of producing 40 000MW and would constitute the world's largest hydropower project.

Wind power in Africa currently makes up only about 1 percent of total electricity. However, an African Development Bank study has concluded that Africa is likely to experience a huge boost in installed capacity over the next few years, with 10.5 GW in the pipeline.²⁴ Some

20 Department of Energy, Republic of South Africa. See http://www.usea.org/sites/default/files/event-file/497/South_Africa_Country_Presentation.pdf

21 T. Kermeliotis, for CNN, "Bright Sun, Bright Future: Can Africa Unlock its Solar Potential?" 29 August 2013. See <http://edition.cnn.com/2013/08/29/business/bright-sun-bright-future-africa/>

22 K. Davis, "Africa's Renewable Energy Potential" See <http://www.africa.com/blog/africas-renewable-energy-potential/>

23 *Ibid.* p. 8.

24 C. Rose, "Wind Power in Africa to Increase Ten Times Over." See <http://www.renewableenergyworld.com/rea/blog/post/2013/05/wind->

76 projects were reviewed in the AfDB study, which noted that most of the completed ones (24 as of May 2013) were in North Africa. However, many other countries, including Somalia, Sudan, Libya, Mauritania, Egypt, Madagascar, Kenya, and Chad have large onshore wind energy potential. Africa's largest wind farm, the Ashegoda Wind Farm, began production in Ethiopia in 2013, aiding that country's efforts to diversify electricity generation from hydropower plants.

Geothermal power is mostly concentrated in eastern Africa, but there are many fragmented spots of high intensity geothermal potential spread across the continent. There is enormous potential for geothermal energy in the East African Rift, which is roughly 3,700 miles in length and spans several countries in East Africa including Eritrea, Ethiopia, Djibouti, Kenya, Uganda, and Zambia.²⁵ So far, only Kenya has exploited the geothermal potential of the Great Rift Valley but other countries would like to exploit their geothermal potential. An important constraint is that exploration and construction of future geothermal plants present high costs for poor countries.

In addition to expanding the use of renewable energy technologies, improving energy efficiency will be an important part of Africa's pursuit of sustainable development. Efficiency improvements can provide cost-effective ways to mitigate greenhouse gas emissions, contribute to economic and social development, and facilitate environmental sustainability. Numerous options exist for facilitating improved energy efficiency in the transportation, industry, residential, commercial, and agriculture sectors. These include, among others, establishment of targets, regulations, and associated policies; reinforcement of regional cooperation and exchange of information on best practices; encouragement of public-private partnerships; and monitoring and evaluating efficiency. Although these and other options

[power-in-africa-to-increase-ten-times-over](http://www.renewableenergyworld.com/rea/blog/post/2013/05/wind-power-in-africa-to-increase-ten-times-over)

25 "Renewable Energy in Africa." See http://en.wikipedia.org/wiki/Renewable_energy_in_Africa#cite_ref-GeoPotEA_11-2

exist, the implementation of policies and measures promoting improved energy efficiency still has a long way to go in most countries in Africa.²⁶

While there is great potential for significantly expanded use of renewable energy technologies and for improving energy use efficiency in Africa, there are also some significant barriers that need to be overcome. Among the barriers generally applicable to all renewable energy technologies are difficulties related to coordination, especially when involving international and regional initiatives. Also, setting environmental standards and targets can involve administration, monitoring, and private sector compliance costs, among others. Consistent and/or favourable renewable energy policies are often lacking in Africa. In addition, the institutional capacity that could facilitate technical, economic, and marketing developments is either lacking or weak. A shortage of technical skills is also often a constraint. And, African governments have not typically encouraged the private sector, banks, and other lending institutions to invest in renewable energy.²⁷ Additional barriers may include high investment requirements, subsidies and tax incentives to fossil fuel development, lack of access to credit, and potential social resistance to unfamiliar sources of energy.²⁸

While these constraints to the pursuit of a green and clean energy future for Africa do exist, the path forward will likely include implementation of the following recommendations, most of which were proposed through work sponsored

by the Africa Climate Policy Centre for the second Climate Change and Development in Africa Conference. Establishment of clear and consistent energy policies that set targets for renewables in the future is an essential first step. Second, regional and continental policies and goals will be needed. Building a clean energy corridor in East and Southern Africa, for example, will require supporting the needed legal, institutional, and technical capacity of regional power pools to drive integration. This will facilitate more systematic consideration of renewable generation options by utilities and planning authorities in countries along the corridor. Third, small-scale renewable energy projects need to be encouraged, and, if they are feasible to scale up, enabling policies should be implemented. Fourth, global carbon trading to attract resources for mitigation efforts in Africa can be encouraged, in particular, as a significant opportunity exists for Africa to profit from the low level of its carbon emissions and high potential for developing clean energy.

Achieving both a scale-up of renewable technologies and greater energy efficiency in Africa will require strong and transparent government engagement as well as the ability of governments and private sector to leapfrog new technologies as they move up the energy ladder. It will also require efficient and active participation and collaboration of the key actors and stakeholders. There appears to be substantial political will to achieve these goals.²⁹ The moment is right for technological advancement that is contoured on African realities.

26 L. Fall, "Achieving Energy Efficiency in Africa: What are the Priorities, the Best Practices and the Policy Measures?" Paper presented at the XXIst World Energy Congress, Montreal, Canada, 12–16 September, 2010

27 Y. Hailu, Y. Mulugetta, Lars. Nilsson, *et al.*, "Integrating Renewable Energy and Climate Change Policies: Exploring Policy Options for Africa," UNECA/ACPC Working Paper, Nov. 2011. p. 14

28 *Ibid.*, p. 14.

29 Fall, *op. cit.*, p. 19.

Strategy 5

Reforming agricultural and food systems through sustainable land management

Agriculture is one of the most important economic sectors in Africa. Nearly 80 percent of Africans live in rural areas and subsist on agriculture, largely by farming small holdings. Thus, the sector has a huge role to play in providing food security and reducing poverty in Africa. However, agricultural productivity in Africa is low, with less than 10% of the arable land currently being used (and many smallholder producers are barely able to meet the consumption needs of their families, much less produce amounts in surplus of these needs).

Incidences of extreme weather events, including droughts and large fluctuations in precipitation patterns and shortening of the lengths of growing periods have been occurring with increasing frequency. Given that agricultural production in Africa relies mainly on rainfall, with less than four percent of cultivated lands under irrigation, such fluctuations expose African agriculture to frequent production uncertainties. African governments are concerned with the impacts of high variability in rainfall and the high incidence of droughts on the agricultural sector and on their economies in general.³⁰ Even in the absence of climate change, population growth in Africa will increase pressure on African agricultural producers to provide enough food for the continent's citizens. With a changing climate, the challenge becomes even greater.

Climate change is likely to have significant impacts on the agricultural sector across Africa. The International

30 T.Owiyo, S.Awulachew, A. Reidacker, and H.Habtmu, "Climate Change and Agriculture in Africa: Analysis of Knowledge Gaps and Needs, UNECA/ACPC Working Paper, November 2011. p. 2.

Panel on Climate Change (IPCC) details many of the likely impacts in its recently released Working Group II report, along with estimates of how confident it is that these impacts will occur.³¹ Included among the more likely impacts are the following: Climate change is very likely to have an overall negative effect on yields of major cereal crops across Africa. Yield losses for maize, for example, could amount to about 22 percent by mid-century averaged across all of sub-Saharan Africa (although above 1700 meters production could expand). Suitable agro-climatic zones for growing economically important perennial crops, such as tea, coffee, and cocoa are estimated to significantly diminish, leading to negative impacts on export earnings. Livestock systems in Africa face multiple stressors (including rangeland degradation and increased variability in access to water) that can interact with climate change and variability to amplify the vulnerability of livestock-keeping communities. Climate change in interaction with other environmental and production factors could intensify damage to crops from pests, weeds, and diseases. African fisheries are also likely to be affected by climate change. In West Africa, for example, the annual landed value of fish is estimated to decline by 21 percent by 2050 due in part to the physical effects of climate change. Although threats stemming from entrenched poverty, environmental degradation, rapid urbanization, and high population growth rates are important factors affecting food security, to these must be added the negative impacts of climate change and increased climate variability.³²

31 Intergovernmental Panel on Climate Change, *op. cit.*, footnote 2.

32 *Ibid.* pp. 19-23.

Given the likely impacts, it is essential that African governments face up to the challenge climate change poses to sustainable agriculture. Adaptation of this sector to climate change will be of crucial importance to Africa's future, not just to improve yield but also to improve the nutritional value of food and to help safeguard the environment. While adaptation presents many hurdles, farmers have always had to adapt to climate variability. Many options exist, and, if hurdles to their implementation can be overcome, these can be tailored to suit specific local circumstances.

Without adequate water, of course, there would be no agriculture. The IPCC notes that it has been difficult to estimate the impact of climate change on water resources in Africa, owing in part to inadequate observational data. Also, factors other than climate change, including population growth, agricultural growth, and land use change may be at least as, if not more, important to water scarcity in the future. Nevertheless, it is likely that some parts of Africa, especially northern Africa and parts of southern Africa will become drier as a result of climate change, and thus will affect rain-fed agriculture.³³

Implementation of the following adaptation strategies can help Africa make the best use of its available water for agriculture and other purposes. Countries could, among other things: augment supply by building new reservoirs and/or expanding use of groundwater where feasible; expand large-scale irrigation; promote efficient use of water resources through drip irrigation, water recycling, and reuse; improve supply management, for example, by using ground and surface water conjunctively and improving reservoir and reservoir-system management; improve demand management through promoting conservation methods; and promote contingency planning for droughts and floods.³⁴

The challenges posed by climate change, along with increased competition for water resources, suggest that investments should be made throughout Africa in integrated water resources management (IWRM)³⁵ and in the related concept of sustainable land management (SLM).³⁶ IWRM seeks the co-ordinated development and management of water, land, and related resources so as to maximize economic and social welfare without compromising the sustainability of ecosystems. The focus of SLM is to increase land productivity and improve livelihoods and ecosystems. It seeks to do this through expansion, intensification and diversification of land use, for example by improving agronomic practices, soil fertility, micro-climatic conditions, and other appropriate land-use techniques.

Some investments in agricultural production technologies and/or adaptation and mitigation strategies—among many that could be mentioned—that can help Africa improve its ability to feed its citizens in a warmer world include: enhancement of farming systems that encourage crop diversification, including the cultivation of more drought-tolerant food crops such as millet, sorghum, and sweet potatoes; optimization of planting dates; improvement of fallow systems and residue management; site-specific nutrient and irrigation management; development of improved crops, including genetically modified crops, with greater resilience to climate change and climate variability; and implementation of weather-based insurance schemes for crop and livestock production.³⁷ The benefits and costs of these strategies in specific locations must be properly assessed for both the short- and long-term, but there are likely to be many cost effective options that will help Africa's agriculture sector adapt to climate change.

33 *Ibid.* pp. 17-18.

34 Office of Technology Assessment, *Preparing for An Uncertain Climate*, Chapter 5 "Water." 1993.

35 T. Amede, S. Awulachew, B. Mati, S. Traore, and M. Yitayew, "Agricultural Water Management in the Context of Climate Change in Africa," UNECA/ACPC Working Paper, November 2011. p. 4.

36 TerrAfrica, *Sustainable Land Management in Practice*. 2011.

37 UNECA, "An Assessment of Agricultural Sector Policies and Climate Change in Kenya: Nexus between Climate Change Related Policies, Research and Practice," December, 2013.

Investing in agro-processing also has an important role to play in helping Africa's agriculture sector adapt to a changing climate. Agro-processing investments will also help create jobs and increase the demand (and prices) for what farmers, especially smallholders, produce. The recent *Africa Transformation Report* highlights three important agro-processing opportunities that should be pursued. First, processing of traditional exports, such as coffee, cocoa, and cotton, (where Africa has demonstrated its global competitiveness in producing raw products, adding value, and creating jobs) can be enhanced. Second, Africa can scale up promising nontraditional exports, such as fruits, by upgrading the supply chain—from farms to processing factories—thereby increasing farmer incomes and generating jobs in factories and allied agribusiness services. Third, Africa can work to displace imports, which have risen 62 percent between 2007 and 2011, with homegrown agricultural products. Upgrading the domestic supply chain so that local players can be on better competitive footing with imports is essential.³⁸

A recent study on agriculture policies and climate change in Kenya has made several recommendations that are likely also to apply to many other countries in Africa. The study's authors suggest increasing public

investment in advanced agriculture innovation, improving the efficiency of agricultural research by reforming the regulatory environment, and strengthening centres of agriculture innovation excellence.³⁹ To these suggestions might be added the need to build the capacity of farmers, agricultural extension personnel, scientists, administrators, and others to understand and cope with the challenges of a changing climate in agriculture.

The role of agriculture is central to most African economies and to the livelihoods of its people. As such, African governments must increase investment in the sector, adopt policies that will promote production (while at the same time taking into accounting the fact that agriculture is dominated by the poor), and encourage adaptation to existing climate variability and long-term climate change. Many win-win options exist to help the agricultural sector in Africa adapt to climate change and to improve the lives of farmers.

38 African Centre for Economic Transformation, *op. cit.*, footnote 1.

39 UNECA, *op. cit.*, footnote 7.

Strategy 6

Enhancing and maximizing tourism potential

The tourism sector has grown dramatically worldwide in the last 50 years, and developing countries, including many in Africa, have participated significantly in this growth. Statistics from the United Nations World Tourism Organization (UNWTO) show that Africa is one of the fastest-growing tourist destinations.⁴⁰ The great national parks and game reserves of East and South Africa, including such well-known ones as Kilimanjaro National Park in Tanzania, the Masai Mara National Reserve and Amboseli National Park in Kenya, and Krueger National Park in South Africa, draw many thousands of visitors each year. Other national parks in Africa attract substantial numbers of visitors, but even those with fewer visitors preserve extensive land areas and afford protection to the diverse flora and fauna that live in them. Likewise, cultural and historical attractions, including such UNESCO World Heritage sites as the pyramids of Egypt, the rock-hewn churches of Ethiopia, the Roman ruins of North Africa, and Gorée Island in Senegal also draw numerous visitors. African coastal resorts in places like Djerba, Tunisia; Mombasa, Kenya; Zanzibar, Tanzania; and Swakopmund, Namibia are very popular and attract hundreds of thousands of tourists. South Africa alone attracted some 860,000 arrivals *per month* in 2008, of which around 210,000 were from outside the African continent.⁴¹

Visitors to Africa's numerous parks, beaches, cultural sites, and cities provide a substantial source of income and jobs to many countries in Africa and are thus one of the main

drivers of economic growth in these countries. Hence, as an important source of income and jobs, as well as a means to protect Africa's biodiversity, ecosystems, and cultural heritage, it is vitally important that Africa's tourist industry be maintained and that its eco-friendly tourism in particular to be expanded. Climate change, however, is now a factor that needs to be considered in planning and managing Africa's further tourism development. This is because tourism is both a source of the greenhouse gas emissions that are causing climate change and because the parks and beaches and other sights and activities that tourists come to Africa to see are likely to be adversely affected in a number of ways by climate change.

Tourism contributes to climate change by way of greenhouse gas emissions from the transport people use to reach tourist destinations and through accommodation and tourist activities. The 2003 Djerba Declaration of the UNWTO acknowledges the need to align the tourism sector with the concerns, objectives, and activities of the UN System relative to climate change and sustainable development.⁴² Some possible ways of mitigating greenhouse gas emissions in the tourist sector include calculating the amount of emissions produced through air travel and applying a customer charge to offset these, favoring tour operators that promote sound environmental practices, promoting the use of more fuel-efficient aircraft, and educating tourism institutions on the role of climate change in tourism.⁴³ In addition, a whole range of mitigation strategies are available that are applicable

40 See <http://www.slideshare.net/andrewwilliamsjr/united-nations-world-tourism-organization-2013-tourism-highlights>

41 On tourism in South Africa see: http://en.wikipedia.org/wiki/Tourism_in_South_Africa.

42 S. Becken and J. Hay, *Tourism and Climate Change: Risks and Opportunities*, Channel View Publications, 2007.

43 S. Uchegbu and E. Kanu, "The Impact of Climate Change on Tourism in Africa." See <http://www.iipt.org/IIPT%20Book/articles/Smart%20Uchegbu.Tourism%20in%20Africa.pdf>.

more broadly but that would lead to reductions in the tourism sector as well. These include switching from use of fossil fuels to renewable energy sources, promoting energy conservation and fuel efficiency, encouraging greater use of public transport, and many others. Clearly, implementing these mitigation strategies in developed countries can have a much more substantial impact than implementing them in Africa, but as noted elsewhere in this document, there are many “win-win” reasons for pursuing low carbon development pathways in Africa.

As for the effect of climate change on tourism, the World Meteorological Organization notes that with its close connections to the environment and climate itself, tourism is considered to be a highly climate-sensitive economic sector.⁴⁴ There will be both winners and losers associated with the impact of climate change on tourism, depending on the location and type of activity, but many impacts are likely to be negative. The negative impacts that climate change could have in Africa and elsewhere include impacts associated with rising sea levels, ocean warming and acidification, desertification and water scarcity, deforestation, harm to biodiversity, the melting of snow and glaciers, and the potential increase of extreme events in major tourist destination areas.

Although the connection between climate change and tourism is receiving increasing attention,⁴⁵ gaps still exist in knowledge of how climate change will affect the natural and cultural resources critical for tourism in Africa. In general, however, rising sea level associated with climate change is likely to lead to beach erosion and loss of land in some coastal resorts. Climate change is also expected to exacerbate inundation, storm surges, and salt water intrusion, thus threatening vital tourist infrastructure in coastal areas and the livelihoods of those who depend on coastal tourism.

44 World Meteorological Organization. See http://www.wmo.int/pages/themes/climate/applications_tourism.php.

45 For example, see Becken and Hay, *op. cit.*

Ocean warming and acidification will lead to damage to, and will potentially kill, coral reefs, a major tourist attraction in some areas. In Mauritius, for example, live corals are projected to be reduced by 80-100 percent in the event of 3°C rise in temperature by the year 2100.⁴⁶

Increased water scarcity, desertification, and land degradation associated directly or indirectly with climate change would lead to decreases in biodiversity and wildlife productivity and make regions less hospitable for both local communities and tourists.⁴⁷ The drying of rivers and lakes would substantially reduce their appeal to tourists. For example, drought in Amboseli National Park in Kenya and the drying of Lake Nakuru would surely deter tourism in these areas.

Deforestation directly reduces the global carbon sink and causes ecosystem and biodiversity losses, thus discouraging demand for ecotourism in previously forested areas.

There are few ski resorts in Africa and only a small number of mountain glaciers. However, the resorts that do exist, for example in Morocco and South Africa, will be affected by decreasing and/or less reliable snowfall, just as lower level ski resorts are now being affected in Europe. Such destinations as Mt. Kilimanjaro may (or may not) be less attractive to tourists once the summit glaciers disappear. Perhaps more importantly, Africa’s few glaciers are locally important sources of water that will eventually be exhausted as a result of climate change.

Finally, changes in a number of weather extremes in Africa and elsewhere are probable as a result of projected climate change. Higher maximum temperatures and more hot days over land areas, greater tropical storm intensity and peak winds, more and/or more intense precipitation over some land areas, and longer and more severe droughts will affect the tourism industry through

46 See http://environment.gov.mu/English/Climate_Change/Pages/Climate-Change.aspx.

47 WMO, *op. cit.*, note 5.

increased infrastructure damage, additional emergency preparedness requirements, higher operating expenses (e.g., for insurance, backup water and power systems, and evacuations), and business interruptions.⁴⁸

Climate change is clearly expected to have a substantial effect on beaches, parks, and other tourist destinations in Africa and on the livelihoods of those working in the tourist industry. Additionally, tourists have many choices as to where to travel and will certainly avoid areas that have become degraded as a result of climate change or other reasons. It is therefore important that serious attention be given to maintaining Africa's natural and cultural patrimony and to diversifying tourist attractions in the face of a changing climate. Multiple approaches will need to be employed to enable tourism to continue to flourish in a changing climate. Adaptation to climate change will require implementation of sound natural resources and coastal zone management policies and practices. In the coastal zone, for example, these may include setback policies, beach nourishment, and/or hardening of high-value tourist zones with seawalls, as appropriate. In natural areas (and, in particular, given the high level of uncertainty associated with forecasting future conditions and the ability to manage for specific goals) management practices that maintain Africa's remarkable biodiversity and increase resilience of wildlife and ecosystems to climate shocks should be pursued. Managers of parks and reserves will need to pay ongoing attention to new scientific discoveries and add adaptive management to their list of management tools.⁴⁹

An option for helping the tourist industry not only to adapt to climate change but also to mitigate greenhouse gas emissions is through the expansion of ecotourism. Africa is already a leader in ecotourism, and many countries in Africa emphasize the benefits of this brand of tourism. Nevertheless, there is significant scope for expansion. Ecotourism seeks to provide holidays with low environmental impacts, promotes preservation of biodiversity and cultural diversity, and typically offers employment to local communities. It thus empowers communities to fight poverty with economic development and to work toward sustainable development.⁵⁰

In conclusion, given the gravity of the challenge climate change poses to Africa, it is imperative that the continent craft a climate development policy which adequately addresses its unique susceptibilities and opportunities. This ought to entail greater investment in climate science, services and the production of high quality data; pursuing a low carbon, techno-economic paradigm; improving climate policy and institutional capabilities; expanding South-South partnerships, particularly in ameliorating risk management; leveraging Africa's agriculture through investing in production technologies, innovation, water use efficiency and sustainable land management; and ultimately, employing tourism for Africa's advantage and the world's biodiversity wealth. In short, Africa, "*preparing for and investing in climate change is costly; but not preparing will be catastrophic and more expensive*". Africa should heed that call without delay.

48 World Meteorological Organization, "Climate Change and Tourism: Responding to Global Challenges," October 2007. See link accessed via http://www.wmo.int/pages/themes/climate/applications_tourism.php.

49 J. Baron, et al., "Options for National Parks and Reserves for Adapting to Climate Change," *Environmental Management*, Dec 2009; 44(6): 1033–1042.

50 See, for example, "Eco Tourism: Following the Eco Path in the Gambia" at <http://www.visitthegambia.gm/eco-tourism.htm>

Statement by Mr. Carlos Lopes UN Under-Secretary-General and Executive Secretary of ECA

Third Annual Conference on Climate Change and Development in Africa (CCDA-III) - Can Climate Change Spring Africa's Transformative Development

Statement by Mr. Carlos Lopes UN Under-Secretary-General and Executive Secretary of ECA

21 October 2013, Addis Ababa, Ethiopia

Your Excellency Mr. Alemayehu Tegenu, Minister of Water, Irrigation and Energy, of the Federal Democratic Republic of Ethiopia

Your Excellency Mrs. Tumusiime Rhoda Peace, Commissioner for Rural Economy and Agriculture, Africa Union Commission

Mr. Aly Abou-Sabaa, Vice President of the African Development Bank

Your Excellencies

Distinguished Ladies and Gentlemen

I am delighted to welcome you all to the headquarters of the Economic Commission for Africa on the occasion of the Third Annual Conference on Climate Change and Development in Africa, organized under the auspices of Climate for Development in Africa, ClimDev-Africa - a programme of the African Union, the African Development Bank, and ECA.

If we go back in history we all remember the time when the black-death plague killed so many people that they must have thought it was the end of their world. Important civilizations died without clear explanations for their sudden fate. The black-death was particularly acute in

Europe, spreading poverty and decimating livelihoods. What came next though was spectacular transformation because less people had more resources, agriculture flourished and trade spread. With the industrial revolution came urbanization, better communications and deep change in the social fabric. For over 100 years, the UK led the industrial revolution, cotton and cotton-derived products were the number one export.

These historical episodes are all related to climate change. It was climate change variations that were at the basis of the black-death. It was the stability of climate that ensued - which lasted 300 years, that allowed many of the human progress witnessed in the wealthiest regions of the world. Predictable winds propelled global routes. Access to water and other key resources were abundant and remained so for a long time.

Well that time is now over and we know it.

We are all certainly expecting this conference to offer a unique opportunity and space to discuss important issues deriving from striking findings and an unpredictable future.

In my opinion, we need to particularly look into two inter-related issues.

First, we need to persuade the skeptics of climate change in Africa, on just how vulnerable we are to it. We should do this by navigating scientific findings and hard facts that make its impact unequivocal. According to the just released report of the Intergovernmental Panel on Climate Change (IPCC) the last three decades have been successively warmer at the Earth's surface than any preceding decade, since 1850. In the Northern Hemisphere, 1983–2012 was most likely the warmest 30-year period of the last 1400 years. Scientists further predict that the current pace of warming is 10 times faster than any other over the last 65 million years.

Warming across Africa is predicted at an alarming rate. We are becoming familiar with some of the effects of climate variability across the continent. For instance, the severe droughts of 2011 in the Horn of Africa and the 2012 drought in the Sahel region affected over 23 million people. There is also the example of ongoing coastal erosion and rising sea levels that threaten the very existence of Africa's Small Island Developing States. Earlier this year, floods devastated Port-Louis, Mauritius' beautiful capital. They were caused by 156 millimeters of rainfall that occurred in just less than two hours, resulting in major damage. The impact of rising seas and increasingly violent and frequent storms can make many tourist beaches disappear by 2050. Even our grandeur continental symbol, the Kilimanjaro, is losing its white cap.

The second issue is about leveraging the opportunities which have arisen from the nexus between Africa's transformation agenda and climate change. With an average GDP growth projected to remain around 5% or more, Africa is likely to outstrip Asia by 2050. Despite an ailing global economy, it is already the fastest-growing continent. . Yet, Africa continues to be patronized and perceived as a casualty of climate change as opposed to a contributor to the solution. It is as if the debate on climate was reduced to how we can adapt to what others cause,

indirectly questioning whether it is time to industrialize and follow the successful path of others. This is wrong and this needs to be counter-argued.

The type of industrialization path Africa chooses will make a big difference. Africa possesses some of the best resource bases for industrial production. Exporting the resources far away deprives Africans from jobs and the world from ensured sustainability, given the Co2 emissions impact of current flows. Africa is exporting jobs precisely when it is about to become the largest reservoir of manpower, projected to surpass China and India by 2040. Shifting production closer to the source would be economically beneficial to Africa by creating sustainable employment and generating wealth, as well as for producers given the increasing industrial unit value accrual in Asia. If it took the UK 155 years to double its GDP during the industrial revolution then Africa has achieved the same in the last twelve. It is imperative to capitalize on growth for real transformation; that means industrialization.

As countries grow, they become cleaner, more urban, more peaceful, more efficient and better informed. This rational is based on the environmental version of Kuznets' curve which describes the relationship between prosperity and inequality in an inverted U shape. In a nutshell, at the early stages of growth, inequality tends to rise; at later stages it falls. Similarly, in the early stages of growth, biodiversity tends to suffer and in the later stages it benefits. We can see this relationship taking form in countries like Brazil and South Korea that were until recently considered poor.

As one of the most vulnerable continents to climate change, Africa's growth momentum faces a fundamental risk. For instance, agricultural production and food security could be severely compromised, given that more than 90 percent of Africa's agricultural production is rain-fed and therefore highly vulnerable to the impacts of climate change. It is estimated that by 2020, yields from rain-fed agriculture in some African countries could decrease by as much as 50 percent, exacerbating food security challenges. Needless to say, this would have dire

socio-economic consequences livelihoods of farmers, pastoralists and agro-pastoralists. The situation could be further compounded by acute water stress in some countries as well as intense changes occurring across the variety of ecosystems.

Rapid urbanization and a population projected to double, to attain 2.3 billion people, over the next forty years, representing about half of the globe's total population growth, looks daunting. It could trigger competition for resources. It can expose the world to a break point with the largest and fastest urbanization seen in history. It can have devastating effects on a unique biodiversity.

All of the above need not to happen though. Africa has the largest reservoir of unused arable land, about 60%, and the lowest agricultural productivity. Copying other regions' experiences and their fortunes can be turned around. Africa needs agro-business and a more efficient use of its resource base. A younger, more educated, connected and urbanized Africa liberates energies, increases women participation and allows for the IT revolution to leapfrog some of the major institutional backlogs. Industrialization can create modern jobs younger Africans long for. They are tired of being poster children for poverty benefactors. They want to be part of transformation.

Having said this, Africa is trapped in global negotiations on climate change which on the whole are largely driven by global and external interests. To enter the solution space, Africa must firm up its own views on how to put the continent's interest first. Climate change offers Africa an array of incredible investment opportunities that can reap dividends. Offering an African climate development policy can respond to the unique vulnerabilities and opportunities the continent faces, while position it to influence negotiations and outcomes.

Let me propose a six point strategy.

First Africa has the potential to leap to a new clean techno-economic paradigm. For instance, the European

Commission's Institute for Energy suggests that just 0.3 % of the sunlight that shines on the Sahara and Middle East deserts could supply all of Europe's energy needs. As Africa is not locked in any technology preferences, it can follow a green and clean energy pathway and leapfrog old carbon-intensive models and pursue a low carbon development pathway. The growing awareness of environmental degradation and climate change is giving rise to new Research & Design priorities like clean energy technologies that could be scaled-up rapidly. The continent is well positioned to absorb, adapt and build on the vast quantities of scientific and technical knowledge already available. Many African countries, such as Cape Verde, Kenya, Ethiopia, Morocco, or Uganda are already investing in innovative renewable and clean energy sectors and offsetting traditional energy sources dependent on fossil fuels, biomass and forest resources.

Second, greater investment in climate science, services and the production of high quality data is imperative for Africa. This is to facilitate the development of early warning systems and initiate much needed research on climate impact, vulnerability and adaptation; and for creating a knowledge economy. Many global, African and national institutions are already making progress in transforming climate data, information systems and science. In fact, one of the fundamental and priority undertakings of the ClimDev-Africa programme, is to make climate information widely available. Recently, ECA with WMO, World Climate Research Programme and the University of Dar Es Salaam among others, concluded a very successful conference in Arusha. The focus was on identifying African climate research frontiers to guide research in the next decade that will contribute to climate information and knowledge, inform policy decisions, and development planning.

Third, we have to improve our institutional and policy capacity. There must be investment in mechanisms for a concerted engagement of all key players. From climate and social scientists, to development economists, policy makers, entrepreneurs, to users of climate information, and so on. Not only would this help coordinate efforts, it

would also contribute to the design of innovative multi-sectoral strategies, mainstream climate change into national development plans, and usher in a new form of deliberative democracy. To prepare for climate risks in urban infrastructure and development, countries could build climate-proof urban infrastructure and development, and put transport systems on a low-carbon path, like Côte d'Ivoire, Algeria, South Africa and others are doing.

Fourth, investing in expanded South-South partnerships can help risk management. By systematically sharing experiences and lessons learned, disaster-prone countries facing similar challenges can arrive at better climate change solutions. For example, the African, Caribbean and Pacific Small Island States share similar challenges. They can step up efforts to address these challenges and establish south-south cooperation to focus on their unique challenge and incubate several options that will insulate them from current vulnerabilities and develop future opportunities. It is essential for Africa to go beyond the sum total of individual countries capacities.

Fifth, let us leverage Africa's agriculture. With a growing population and an ever-increasing demand for food, investments in agriculture are critical. Investing in production technologies, innovation, water use efficiency and sustainable land management are essential. The bulk of agricultural export across the continent is still predominantly in the form of primary products, with very limited value addition. Leveraging the capacity of the private sector to scale-up investment in agro processing would create jobs and diversify export commodities. Unlocking the sector's strong multiplier effect in the economy would further contribute to increased incomes and poverty reduction.

Sixth, let us use tourism for Africa's advantage and the world's biodiversity wealth. According to the UN World Tourism Organization, Africa is one of the fastest-growing tourism destinations. There is already growing recognition of the urgent need for the tourism industry, national governments and international organizations to develop

and implement strategies to face the changing climate conditions. Scaling-up investments in ecotourism could mitigate tourism's environmental impact like The Gambia, Kenya, Rwanda, Zambia, Seychelles and South Africa examples are demonstrating.

Ladies and Gentleman,

Preparing for and investing in climate change is costly. But not preparing will be catastrophic; and more expensive. This leads me to reflect briefly on whether the Global Climate Change Framework is effectively concerned with Africa.

Of all the regions of the world, Africa is believed to be the one causing the least harm to climate. Africa is a green continent, not necessary in color but in attitude. Its CO2 emissions per capita are less than one ton per annum. It accounts for just 2.4 percent of world emissions. However, climate damage as a percentage of GDP is higher in Africa than elsewhere in the world. Despite the [United Nations Framework Convention on Climate Change \(UNFCCC\)](#), Africa remains a creditor of a massive ecological debt.

The UNFCCC must be congratulated for its relevance over the years and elevating climate change issues to the highest political attention. Thanks to it developed countries have committed \$100bn US dollars a year by 2020 on climate finance for developing countries under the Green Climate Fund. This is good. But it is not enough.

Twenty-one years after UNFCCC establishment, global emissions have risen and major emitters are still not legally bound to reduce their emissions at the scale required to avoid irreversible climate change. Instead, those directly causing 80% of global emissions are reversing the tide by rejecting the notion of an ecological debt. The amounts Africa receives for adaptation is negligible, in average less than 2% of the total. Economic development has not been at the forefront of climate negotiations and a 'loss and damage' account never been agreed. Is this compatible with the Africa we want?

The next Conference of Parties (COP 19) will be taking place in Warsaw in November with the aim of reaching a comprehensive agreement on climate change by 2015. It presents an opportunity for the continent's voices to influence the debate. For instance, demanding that research on 'loss and damage' from climate change related disasters be funded.

Going forward, climate justice will be central to the COP 19 discussions and it should be viewed from a pragmatic perspective. Many would argue that principles of corrective and distributive justice should apply. The expectations are that developed countries take the lead and bear the burden in combating climate change, because they have been the major contributors to it in the past. I am of the opinion that climate justice is not to be reduced to a medium through which we solve problems such as wealth distribution or correcting colonial injustices. It is only a matter of time before developing nations catch up with the developed world with regards to cumulative emissions.

Climate justice is about advocating for a multi-dimensional type of justice that encompasses accountability. It is

not solely concerned with equity in the distribution of environmental risk and benefits. There is a marked difference in the way climate disruption harms peoples' lives and livelihoods across cultures, communities, disciplines, nations and regions of the globe. It involves acceptance of common but differentiated responsibilities; and the respective capabilities in relation to reduction of greenhouse gas emissions. Those who have most responsibility for greenhouse gas emissions, and most capacity to act, must cut emissions first. After all any well designed climate change agreement must balance costs and benefits.

Ladies and Gentleman,

Climate change was responsible for bad and good in the past. Most of it happened without humans having a clue why it was so. Now we know. To avoid the bad and aim for the good Africa can take the lead. We should not be spectators.

